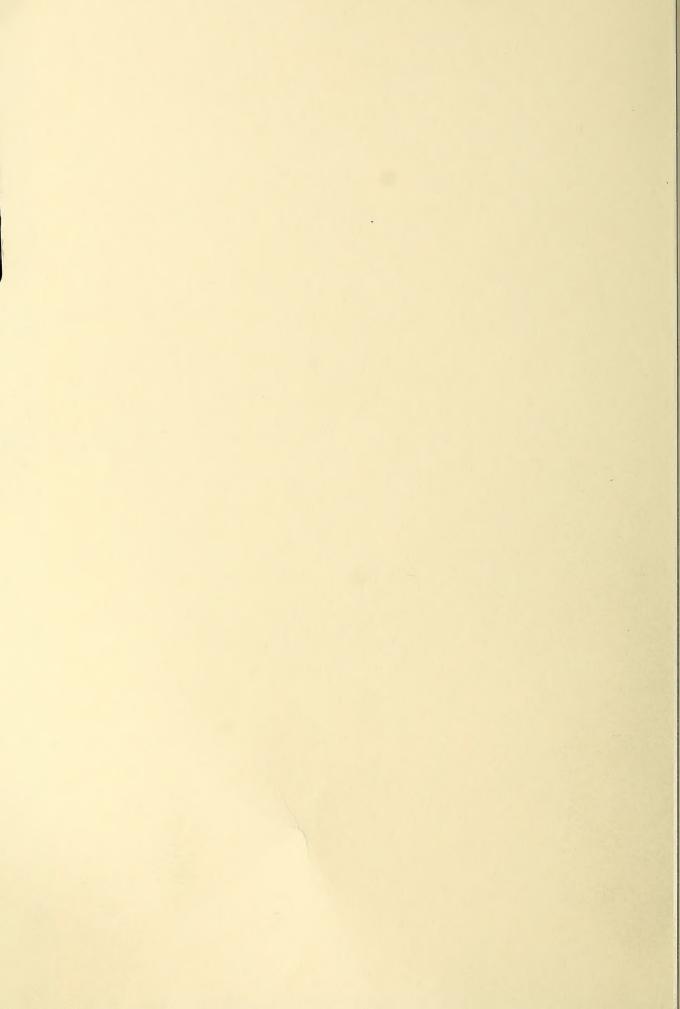
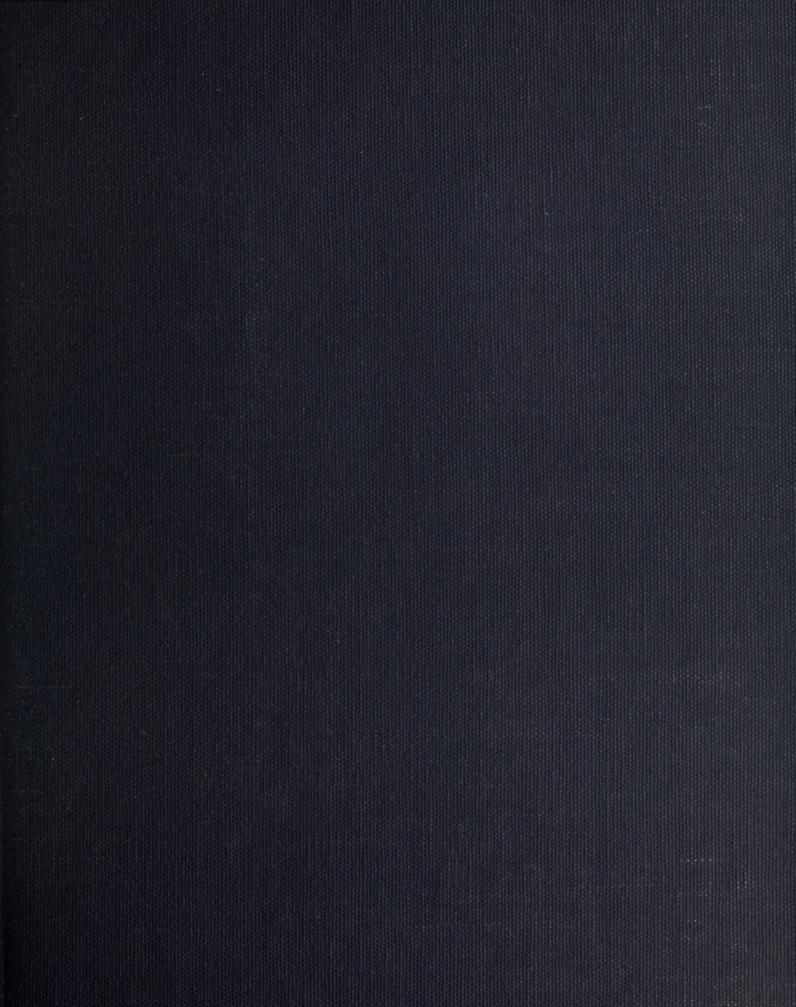
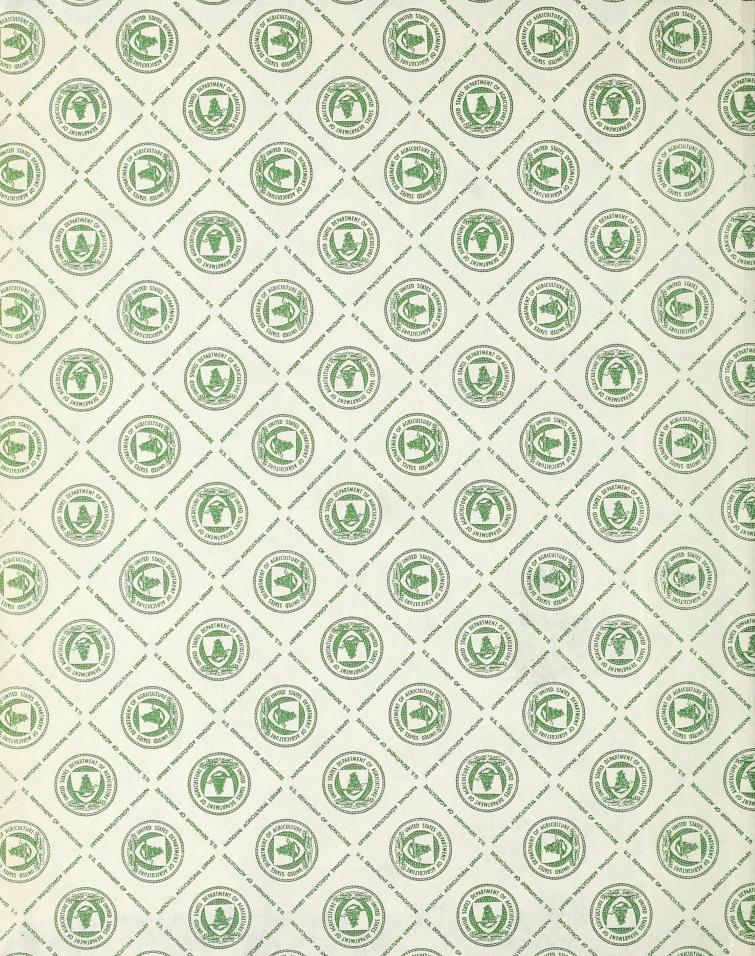
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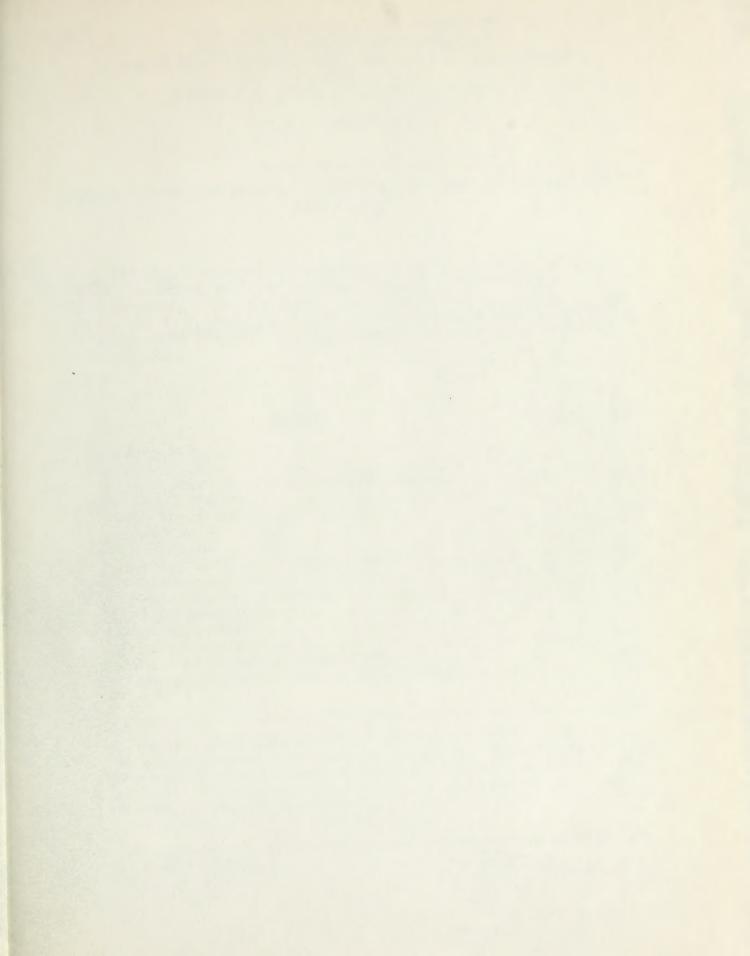


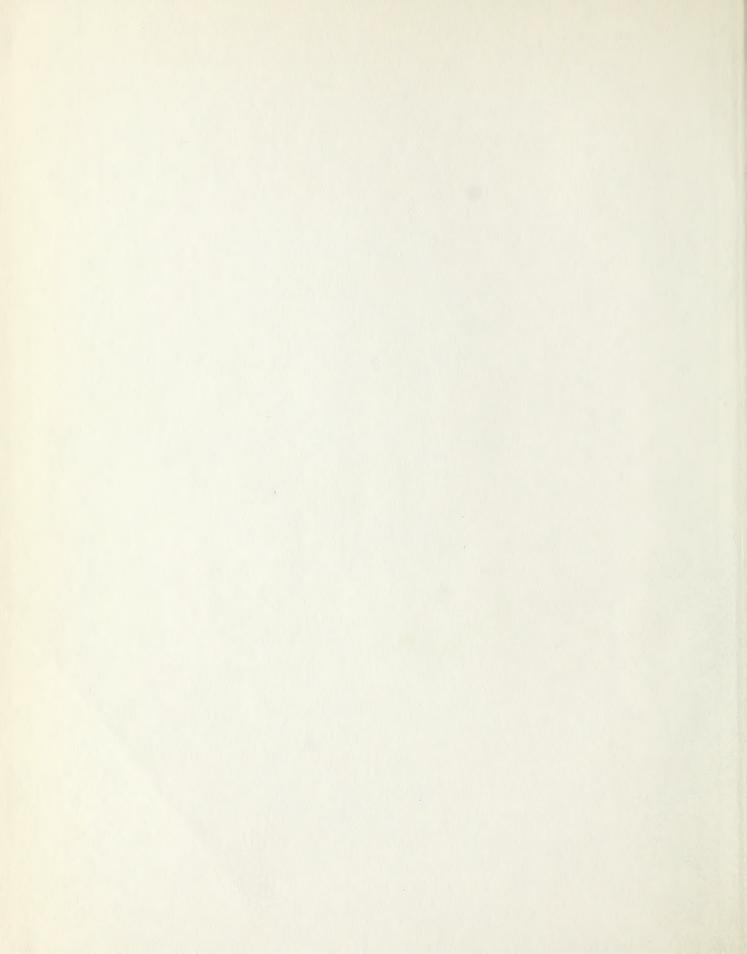












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UNITED STATES DEPARTMENT OF AGRICULTURE AGRICULTURAL RESEARCH ADMINISTRATION

Bureau of Plant Industry, Soils, and Agricultural Engineering and

PRODUCTION AND MARKETING ADMINISTRATION

(NOT FOR PUBLICATION)

MILLING, BAKING, AND CHEMICAL EXPERIMENTS WITH HARD RED SPRING WHEAT 1950 CROP 1/

BY

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Cooperative investigations of the Division of Cereal Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration and the Grain Branch, Production and Marketing Administration. The samples were obtained from the cooperative experiments with the State Agricultural Experiment Stations in the spring wheat region.

Plant Industry Station Beltsville, Maryland 23500 - June 1952



INTRODUCTION

Samples of the standard varieties and some of the new hybrid strains of hard red spring wheat, grown in cooperative experiments in the spring-wheat region 2 of the United States, are milled each year by the United States Department of Agriculture and the flours baked into bread to determine their quality characteristics.

The baking methods and techniques used on the 1950 crop were essentially the same as used in testing the wheat varieties and hybrid strains for the 1944 to 1949 crops, inclusive.

The purpose of this report is to make available to cooperators the quality data from the 1950 crop obtained from standard varieties, new hybrid strains, and commercial hard red spring wheat.

SOURCE OF SAMPLES

Tests were made on Eastern and Western composite samples of each of five uniform varieties and of many additional varieties and strains grown in plot experiments at cooperating stations. These included samples grown at Madison, Wis.; Morris and Crookston, Minn.; Fargo, Langdon, Edgeley, Williston, Minot, Mandan, and Dickinson, N. Dak.; Brookings, Eureka, and Highmore, S. Dak.; Havre and Moccasin, Mont.; Sheridan, Wyo.; and Akron, Colo. Similar tests were made on Eastern and Western composites of the 26 strains grown in the Uniform Regional Nurseries; on the wheats in the North Dakota and Montana Intrastate Nurseries; and those from station nurseries grown at Brookings, S. Dak.; Langdon and Dickinson, N. Dak.

There were also included 20 samples composited from samples of carlot receipts of wheat accumulated during a 90-day period of the 1950 crop movement by the Minneapolis, Duluth, Denver, and Great Falls offices of the Grain Branch, Production and Marketing Administration. These samples represent country-run receipts of the class hard red spring wheat and included only those lots that were graded No. h or better under the official grain standards of the United States. These are hereafter referred to as commercial samples. This is the twelfth season that such samples have been collected and tested.

METHODS USED IN THE MILLING AND BAKING TESTS

After the removal of dockage the samples were prepared for milling by use of a milling separator and a scourer (both machines of experimental or laboratory size). The wheat samples were tempered in two stages. The water for the first temper was added 72 hours prior to milling and raised the

^{2/} Clark, J. A. Results of spring wheat varieties grown in cooperative plot and nursery experiments in the spring wheat region in 1950, with averages for 1938 to 1950. U. S. Dept. Agr. Res. Admin., B.P.I.S.&A.E., Div. Cereal Crops & Dis. 192 CC, 53 pp. April 1951. (Processed.)

moisture content of the grain to between 13.0 and 16.0 percent or within 1 percent of the total moisture required depending upon the hardness of the variety. The additional 1 percent of water for the second temper was added 1/2 hour before milling and raised the moisture content of the grain to between 14.0 and 17.0 percent. The wheat was milled on an Allis-Chalmers experimental flour mill provided with three break rolls and one smooth roll. A 90 percent patent flour used in the chemical and breadbaking tests was made, discarding the low grade flour. The flour yield data in the tables are reported on the basis of a straight grade flour (100 percent) obtained from each sample.

The test-weight-per-bushel of each sample was determined in the laboratory on the dockage-free wheat. The protein and ash contents are reported on a 14.0 percent moisture basis and the flour yield on a moisturefree basis.

The hardness of the grain was determined by pearling 20 grams of dockage-free whole wheat for 1 minute in a model No. 38 Strong-Scott Pearler. The amount of material pearled off expressed as a percentage of the wheat is called the pearling index. This pearling index has been found useful not only as a guide in tempering the samples for milling, but also as a measure of the vitreous character of the grain. A low index figure indicates hard grain and a high index figure indicates soft grain.

The bread-baking tests on the 1950 samples (same as used on the 1944 to 1949 samples inclusive) were made by a rich formula with none or varying amounts of potassium bromate added.

The method used in 1950 with the various ingredients is shown in table 1.

Table 1.--Baking method used for samples of the 1950 crop.

Ingredients and treatment	Weight of ingredients, etc.
Flour (grams) Yeast (grams) Salt (grams) Sugar (grams) Potassium bromate 1/(mgs.) Malted wheat flour (grams) Nonfat dry milk solids (grams) Shortening (grams) Water absorption (percent) Mixing time (minutes) Fermentation time (minutes) Handling of dough	100.0 2.0 1.5 5.0 Optimum 25 4.0 3.0 Optimum Optimum Optimum 180 1st. punch after 105 minutes 2nd. punch after additional 50 minutes Mold after additional 25 minutes Proofing time - 55 minutes Baked 25 minutes at 450°F.

^{1/ 0} to 4 mgs. of potassium bromate used to obtain maximum loaf volume.

This baking procedure is based on the method of the American Association of Cereal Chemists, with certain modifications deemed necessary for unbleached, experimentally-milled flour.

A check or standard flour (12.6 percent protein and 0.48 percent ash on a 14.0 percent moisture basis) was included in the baking trials with each day's tests. The average loaf volume of baking tests made with the standard flour was 794 cc. and the standard error was 15.9 cc. On this basis the least significant difference between 2 single bakes is 45 cc.

EXPERIMENTAL RESULTS

The quality results for the plot and nursery composite and station samples are given in tables 2 to 8. The results for the commercial samples are shown in table 9, and the correlation and regression coefficients for 8 varieties and strains are shown in table 10. Summaries of new promising strains compared with Thatcher are shown in table 11. These tables are largely self-explanatory. The varieties or strains are arranged in the tables in order of their maximum loaf volume. Acre yields are included, where comparable, to assist in the interpretation of results.

Table 2.-- Yield, milling, baking, and chemical results on the uniform varieties of hard red spring wheat grown at experiment stations from the Eastern and Western composites of the 1950 crop.

Variety or	C. I.		Test :]	Pearling:	Protein	ein	Flour		bsorp-	Absorp-:Wixing:		Optimum Baking Wethods	ing Metl	spou
Cross	No.	*Yield:	:Weight: .	Value	Wheat	Flour	rq:	Ash :	tion	0)	Rromate: Loaf :Crumb: Grain Rromate:Volume:Color:Texture	: Loaf :Volume	:Color:	Grain Fexture
		Br.	Lbs.	Pct.	Pct.	Pct	Pct. P	Pct.	Fot.	Min.	Mg.	පි	Score	Score
Eastern Composite 1/														
Lee	12488	29.1	60.7	31	13.9		74.3	*4 4	2	3.0		820	100	8
Thatcher	10003	23.8	58.5	24	12,9		74.7	64.	62	3.5	0	824	8	06
Rival	11708	25.6	59.6	27	12,4	11.5	75,1	.44	63	3.0,	0	815	82	8
Cacet	12053	24.5	57.8	24.	12.7		71.6	.45	63	3.0	0	786	3	06
Mida	12008	27.2	8°09	. 82	12.8		74.2	•44	62	2.5	0	752	06	06
Averade		26.0	59.5	27	12.9		74.0	45	63	3.0	0	805	68	90
Range		5.3	3.0	, ,	1.5	1.7	3.5	•05	2	1.0	0	86	50	0
Western Composite 2/													;	1
Pilot	11945	24.0	58.5	27	15.2		71.9	44.	2	2.5	0	974	8	82
Thatcher	10003	26.3	59,2	28	15,3		73,3	45	2	2.5	-1	696	8	82
Cadet	12053	24.5	58.0	27	15,3		72.8	.47	99	2.5	-	926	ထ	82
Lee	12488	24.5	29.7	32	15.7	15.2	74.4	.46	99	O 6	1 :	606	82	က္က ဗ
Mida	12008	23.6	0.19	30	14.9		74.9	.46	29	2.0	-1	202	001	5
			Andrew March Control of the Control	-	-									
Average	,	24.6	59,3	59	15,3	14.6	73.5	•46	2	2.5	.80	934	8	98
Range		2.7	3°0	<u>ن</u> ر			Ó 8	•05	4	1.0	rd .	112	20	വ
		C. S. C.	Commercial Controlled to the second	Control of the Contro										
Average of Eastern & We	& Western Compasi	ompesita	. કરા											
Thatcher	10003	25,1	58.9	26.			74.0	.47.	63	3.0	0.5	897	80	88
Lee	12488	26.8	60.2	31.	14.8	14.2	74.4.	•45.	65	3.0	D.	880	<u>e</u> 6	88
Cadet	12053	24.5	57.9	52			72.2.	946	65	8,8	ص ال ا	871	ထွ ပ	88 8
Mida	12008	25.4	6.09	56			74.6	.45.	29	2,3	o. O	^ OB	ე ე	06
									1	0		790	6	00
Average Range		20 20 20 20 20 20 20 20 20 20 20 20 20 2	ر م م م	e 9	14.2	13°2	73.8 4.5	.02	₹'m	7.2	00	50 50 50	12g	201
									,	,				
						-	The second second second	-						

From the Madison, Rosemont, Waseca, Morris, Crockston, Langdon, Fargo, Edgeley, Eureka, and Highmore stations.

2/ From the Dickinson, Minot, Williston, Havre, Mcccasin, Sheridan, and Akron stations.

Table 3.--Yield, milling, baking, and chemical results for the leading hard red spring wheats grown in replicated "plots" in 1950.

					Madisc	Madison, Visconsin	ursuoc								
Variety or	: State or	H D	I. Acre	Test :	Pearl-:	Protein	in :	Flour		bsorp-	Absorp-:Wixing:		Optimum Baking Wethods	ng Weth	ಂಡಿಣ
Cross	N. No.	No.	70	eight:		Wheat Flour Yield	lour 1	rield.	Ash	tion	Time	Eromate: Loaf :Crumb: Grain: Eromate:Volume:Color:Texture	: Loaf	Loaf :Crumb: Grain	Grain
			Bu.	Lbs.	Pct.	Pct. 1	Pct.	Pct. F	Pct.	Pct.	Min.	Mg.	ပ္ပ	Score	Score
Thatcher		10003	25.7	58.7	٦.	11.4	10.6	72,1	•56	. 29	2.5	rel	729	9	80
Cadet	:	12053		59,3	22	10,2	9.6	71.4	*62	62	3,5	~	695	75	80
Mida		12008	. 28.1	2.09	27	10.9	10.1	72.8	09.	62	2,5	0	687	75	80
Henry x Cacet	2239	12779	28.9	59.1	56	10.6	9,5	73.1	.51	58	3.0.	-	683	2	80
Lee		12488	. 25.9	6.09	56	11,3	10,1	74.3	•54	62	2.5	0	675	75	82
Sturgeon		11703	23,3	61.2	58	10.9	10.0	75.2	.61	58	0°6	, - 1	675	75	75
Rushmore	,	12273	21.6	9.09	24	10.7	10.0	75.5	,53	09	ر ال	0	699	2	75
H-194-41	W. 246	12649	32.1	0.09	56	10,0	တ္ ၊	73.5	.52	. 28	ဝ ၊ က (0	999	75	75
Rival		11708	25.8	60.3	58	10,3	ດ້ວ	76.1	520	9 7	2,5	0 -	663	7. S. 3.	က္ဆ
Henry		12265	32.1	59.7	200	20 C	η u	77.60	Ն ը	¥ 8	0,0	- 1 C	000	0 7 7	2 6
H-195-45	W. 242	12484	30.4	4.09	87	0.6	ກຸ	0.4/	000	28	٠ ٢	>	TCO	0	2
						1							OF C	i	
Average			27°T	00.1	17	C°OT	Q (B*F/	ر د د د	ე ე (6,7	0 4 °,	B/0	7/	9 6
Range			10.5	2,5	07	2.0	2•3	4.1	71.	ω _. ·	O.1	-1	78	07	70
					Morr	Morris, Minnesota	nesota								
Lee	,	12488	36.7	61.1	31	15.2	14.7	76.8	•62	29	2,5	H	859	85	82
Rival Wahpeton		12772	36.1	59.8	27	12.9	17.1	76.1	. 55	900	2 52	, , , , , , , , , , , , , , , , , , , ,	722	22	
Average Range		*	34.7	60.7	29	13.4	12.9	76.7	.59 .07	99	2.5	. H	781	82 10	63
									The state of the s						
:					Crookst	Crockston, Minnesota	nnesota	· at f							
Amlo x Newthatch	3681	12787	25.3	55.7	31	12.0	11.5	72,3	.47	61	2.0	Н	853	06	85

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Williston,]	1
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Table 3.-Continued.

Variety or	: State or	, Ç	I. Acre	Test:	Pearl-	Protein	ein :	Flour		-bsorp-	: :Absorp-:Mixing:		ım Baki	Optimum Baking Methods	sp.
	. N. No.	No.	ರ	ديـ		Wheat Flour Yield	Flour 7		Ash	tion	Time	Bromate	: Loaf	:Color:Texture	Grain
			Br.	Lbs.	Pct.	Pct.	Pot.	Pot. F	Pct.	Pot.	Min.	Mg.	පි	Score	Score
Pilot		11945	26.0	58.0	5 2	16.9	14.3	73.3	•45	65	. 3°G	0	942	85	90
Lee		12488	26.2	0.09	33	15.8	15,4	74.5	•45	29	ອີ	~1	631	92	06
2744 x 2809	Ns. 3274	12643	26,1	20.6	33	16,3	15.4	75.5	.47	99	2.5	~	928	100	82
Cadet		12053	27.0	29.0	90	15.4	15.1	74.7	.51	29	0 6	~ 1	922	00 1	00
Redman		12496	27.3	58.8	35	14.7	14.3	74.7	*47	65	O 1	r=4 i	917	8 8	က္က
Rescue		12435	22.6	59.5	32	0 1	15,6	73.6	94.		က် (၁)	⊢ 4 ,	902	8	တို့ မ
Ceres		0069	27.1	60.5	27	15.7	15.4	75.9	20 9	89 (ຕຸດ	-1 (803 803	သ င်	က္က ဗ
Thatcher		10003	29.0	59.3	82	6 6	14.5	74.3	φ. Σ	ဂ္ဂ) ၂၈ () r	8/3	5 6	3 8
Rival		11708	0,00	000	0 6	14°C	0. 4.C	70.4	94°	00	ນ ທີ່ຖ	-d p-	1/0	က င	: S 'ñ
Hed Thatcher Mida		12008	25.7	61.3	33	15.1	14.5	76.0	4.0	3.2	2.0		859	95	3 8
Averade			26.5	59.7	31	15.4	-14.9	74.8	48	99	3.0	.82	901	85	88
			6.4	C	0	1.6	1.6	m	90	ហ	1.5	-	83	30	iΩ
					Fondo	Month	Dakota	:							
					1 94 80	- i - i	i 4								
Amlo x Newthatch	3662	12908	36.4	58.0	56	14.3	13.9	75.7	44.	2	2.0	rd (916	06	0.0
1764 x Henry	2211	12733	36.1	60.1	56	0,0	12.7	72.2	245	29	0,0	~ (856	3 8	S, 6
Lee x 3175	3654	12907	36.8	60.7	50	13.6	12,8	75.7	45	69	2 K	N r	842	3 1	S 8
Thatcher		TOOOS	32.5	ກີ ເຄື່ອ	22	ם ה ה ר	12.0	75.9	4° α Σα	2 G	, c	-1	220	0 6	0 0
Tee		12490	30.7	0,00	200	13.61	13.2	75.01	24.	3 %	200	۱ ۸	818	8 8	2 2
Chadet		12053	28.5	26.36	200	13,1	12.5	74.7	7.00	3 63	2,5	1	815	855	85
Rushmore		12273	34.9	60.5	50	13.6	12.9	76.6	43	15	2.0	. 2	812	80	85
Amlo x Mewthatch	3681	12909	36.0	0.09	56	12.9	12.2	75.5	.45	63	2.0	2	812	90	82
2744 x 2809	3274	12643	28.2	59.1	56	12.7	11.7	76,3	,43 •	61	2.0	2	801	82	06
Pilot x Merit	2012	12493	32.7	59.1	20	12.7	11.8	73.7	649	2 ;	0,1	0	798	82	82
remier		11940	30 30 30 30 30 30 30 30 30 30 30 30 30 3	61.6	27	12.6	12.1	76,3	.46 .46	19	ر د د	; ` i ∈	18/		က မ
KIVAL 1760 - Minitain	0.11	11/06	5 8 5 C	20,00	2 6	75.27	0.11	70°4	44.	\$ 5) (c) r	766	200	0 0 0
Marchia	2313	26/13	0.45	56.0	67	12.0	C. L.	7°07	643	7 5	200	-i C	743	8 6	S K
Mida		12008	32.2	000	26.	12.0	11.	27.0	47	3 6	0		924-	8 2	80
Ceres		0069	25.8	58,1	10	11.9	11.2	71.8	45	. 62	0.2	0	709	2	82
Wahpeton		12772	30,3	60,3	24	11.9	11.2	75.1	44	65	2.0	0	699	75	75
Chaffee		12510	28°3	60.3	12	12.1	11.4	75.6	.45	99	2.0	0	674	30	82
Average Range			32.2	59.4	25	12.8	12.1	74.8-	45	63	2.0	1.00	788	800	35
	121 management 123				A CONTRACTOR OF THE PARTY OF TH	j		THE R. P. LEWIS CO., LANSING, MICH.		The same of the sa	many min min many many many many many many many man	Christian de Carriera			

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Edgeley, North Dakota

Variety or	: State or	.C. I.:Acre	** **	Test:	Fearl-	Protein	ein :	Flour		Absorp-	:Absorp-:Wixing:		mu m Bak	Optimum Baking Wethods	hods
Cross	. N. No.	No, :Yiel	ರ	Weight Index		Wheat	Wheat Flour Yield	Yield.	Ash	tion	. Time	Promate		: Loaf :Crumb: Grain :Volume:Color:Texture	Grain Texture
			Bu.	Lbs.	Pct.	Pet.	Pct.	Pct.]	Pot.	Pet.	Min.	Mg.	ပ္ပ	Score	Score
1764 x Henry	2211	12733	19.2	58.4	34	15.5	14.9	72.9	64.	68	2.2	2	626	80	80
		12488	25.9	58.8	34	15.0	14.4	74.3	.48	63	2,5	0	936	6	82
2744 x 2809	3274	12643	19,1	57.8	35	14.5	13.6	75.7	.49	99	5.0	2	923	82	80
Lee x 3175	3654	12907	20.6	29.0	34	14.7	14.0	74.9	.50	2	2,5	Н	910	80	90
		11708	21.6	57.2	31	13,4	12.6	76.4	.46	63	2,5	0	883	82	82
Thatcher		10003	19,3	57.4	28	13,4	12.7	74.4	.48	62	5.5	~ I	872	82	06
Redman		12496	21.5	57.8	33	13°0	12,5	75.2	.45	63	2.5	٦	826	82	92
Rushmore		12273	20:9	58.9	34	13.8	13,1	75.8	.45	. 62	2.0	0	848	82	06
Cadet		12053	20,2	56.6	56	13,3	12.7	72.6	.46	. 29	2.5	Н	836	8	92
Mida	:	12008	24.5	59.7	33	13.4	12,9	75.6	.48	63	2,0	Н	818	82	06
Filot x Merit	2012	12493	22,4	59.1	22	13,5	12.5	73,1	.45	99	2.0	0	810	80	82
Lahpeton		12772	20.6	58.6	28	12.9	12,1	75.3	.44	63	2.0	0	692	75	80
Average			21,1	58,3	31	13.9	13.2	74.7	47	2	2.3	.75	868	84	87
			2		10	0	2 2	α	90	v	7	0	190	15	75
kange			10.4	T*C	2	0.2	0.7	0 0	000	0	2	7	750	CŦ	Ç.
				-14	angdor	, Nort	Langdon, North Dakota	62							
Cadet		12053	38.2	59.0	20	12.0	11.4	74.7	48	68	2,5	2	738	75	80
Pilot2 & Monit	27.74	12732	42 B	60.0	10	12.2	21.3	72.5	48	69	2.0	_	712	80	SO.
2744 x 2809	3274	12643	43.0	60.2	27	12.7	12:1	74.3	44	67	2.0	ı –	707	85	80
Amlo w Mewthatch	3681	12787	46.0	100	ر بر	12.4	2	73.8	46	99	2.0	1 0	698	8 8	80
1 1	2313	12778	45.0	60.6	2 00	37	21.2	76.1	.47	99	200	0	689	202	80
2		12488	50.0	61.5	27	12.6	12.2	73.0	:45	99	5:0	-	089	06	85
Rival		11708	44.2	59.8	23	12.4	11.8	76.4	.47	99	2,5		699	75	80
Redman		12496	40.7	0.09	27	11,5	11,1	74.6	.44	99	2,5	0	662	75	85
Mida		12008	43.8	62.0	56	11.8	10.9	75.5	.45	99	2.5	0	649	80	06
Thatcher		10003	38.3	60.3	22	11.5	10:7	75.2	.43	64	2.5	0	949	75	82
Average			43.0	60.4	25	12.1	11.5	74.6	46	. 67	2.3	09	685	79	83
Range			11.8	3.0	20	1.2	7	0	0.5	, נר	, r.		00	20	01
)		3	})		1	1	3 .	}

Dickinson, North Lakota

Table 3.-Continued.

Variety or	: State or	C. I.	Acre:	Test	Fearl-	Protein	ein ;	Flour		Absorp-	: :Absorp-:Mixing		num Bak	Optimum Baking Methods	hods
Cross	No. No. : No. : Yield:Weight:Index	No.	Yield:	Weight		Wheat Flour Yield	Flour	Yield.	Ash	tion	Time	Bromate	Loaf	:Color:T	: Loaf : Crumb: Grain
		İ	Bu.	Lbs.	Pct.	Pct.	Pct.	Pct. 1	Pct.	Pct.	Min.	Mg.	ပ္ပ	Score	Score
Pilot		11945	18.5	58.9	56	15,4	14.9	73.2	45	63	2.0	′ਜ	986	80	06
Cadet		12053	21.2	58,1	28	16.7	16.2	73.7	*48	99	2,0	2	086	82	06
Rescue		12436	19,0	59.7	30	15.6	15,2	73.0	°46	19	2.5	Н	096	80	92
1764 x Henry	2211	12733	19.7	59.4	53	16.0	15.5	6.69	.41	. 29	2.5	5	959	80	06
Haynes Bluestem		2674	16.7	58.7	30	15.7	15.4	70.6	47	65	2.5	H	951	80	92
Pilot2 x Merit	2174	12732	18.9	59,3	22	15.0	14.6	72.6	.48	65	2,5	ო	948	80	06
Lee		12488	19,1	0°09	31	16,3	16.0	72.2	.49	20	2.0	2	934	82	06
Ceres		0069	19.2	60.7	56	15.9	15,2	72.0	.47	65	2,5	H	633	85	90
Rival		11708	19.5	60.4	28	15.0	14.5	76.5	49	65	2.0	Н	931	82	82
Mida		12008	20.5	61.3	30	15,3	14.8	75.6	•46	99	2.0	2	928	92	82
Red Fife	•	3329	.18°5	60.1	30	14.6	14.4	71.5	940	92	2.0	2	925	80	82
1750 x 1753	2115	12640	19,8	61.0	27	16.3	16.0	73.7	.45	8	2.0	m	914	80	95
Thatcher		10003	18.2	9°69	28	15.0	14.5	71.7	.43	63	2,5	H	911	75	82
Pilot x Merit	2012	12493	18.2	0.09	23	14.8	14.4	72.7	•45	99	2,5	H	808	. 82	06
Marquis		3641	17,8	29.7	28	14.9	14.4	71.5	.48	2	2.5	Н	905	8	06
Regent x Mida	1843-41	12542	20.4	61,3	30	14.8	14.3	74.8	•45	63	2.5	2	803	80	82
Redman		12496	19.6	57.7	28	15,1	14.7	72.8	•45	2	2,5	r-i	894	8	06
1552 x Mida	2083	12543	17.5	60.7	53	14.4	14.0	71.5	4.	9	2.0	2	892	8	92
2744 x 2809	3274	12643	18,4	8,09	30	15.6	15.2	74.9	•44	63	2.0	7	888	75	8
Wahpeton		12772		61.1	31	15.9	15,3	75.0	.47	65	2.5	٦	876	. 75	82
Rushmore		12273	18.9	60.7	31	15.2	14.7	75.1	•45	29	2.0	- 4	868	80	80
Average			18.9	0.09	28	15.4	15.0	73.1	46	. 49	2,3	1.52	924	82	06
Range			4.5	3.6	0	2,3	2.2	6.6	08	7	0.5		118	2	10
))	,)	1	•) .)	J	1)	H

Table 3.--Continued.

Minot, North Dakota

Cross N. No. H. No. H. H. H. H. H. H. H. H. H.	Ash Pct.	. Time		L	
Sask. 2176 12639 21.6 60.5 31 14.8 14.5 75.7 51 Nis. 3274 12643 23.2 59.6 35 15.7 15.0 75.7 51 Nis. 3274 12643 23.3 59.2 32 16.7 15.0 75.9 51 12496 21.6 60.0 35 14.6 14.3 74.7 50 12273 23.3 61.0 37 15.5 15.1 77.9 53 12495 21.6 57.5 28 14.1 13.6 72.9 49 12495 16.0 57.5 28 14.1 13.6 72.9 49 11945 16.8 58.5 29 14.5 13.7 75.9 49 11945 16.8 58.5 29 14.5 13.7 75.0 47 Nis. 3681 12787 27.2 59.5 33 16.0 15.7 75.4 55 1270 2 24.6 61.1 32 15.1 14.1 72.6 53 1270 2 24.6 61.1 32 15.1 14.1 72.6 53 1277 2 28.8 61.8 32 14.6 14.5 75.7 54 55 12008 24.6 61.1 32 15.0 76.2 57 12008 24.6 61.1 32 15.0 76.2 57 12008 24.6 61.1 32 15.0 76.2 57 12008 24.6 61.1 32 15.0 76.2 57 12008 24.6 61.3 32 15.1 14.1 75.6 55 12008 24.6 61.3 32 15.1 14.1 75.6 55 12008 24.6 61.3 32 15.1 14.1 75.6 55 12008 24.6 61.3 32 15.1 14.2 76.7 55 12008 24.6 61.3 32 15.0 14.6 74.6 51 22.7 59.8 61.8 32 14.4 14.2 76.7 55 12008 24.6 61.3 32 12.4 76.7 55 12008 25.0 15.0 55 12008 24.6 61.1 32 14.0 74.1 56 12008 24.6 61.1 32 13.9 12.0 76.2 57 12008 24.6 61.1 32 15.0 14.6 74.6 51 12008 24.6 61.1 32 15.0 14.6 74.6 51 12008 24.6 61.1 32 15.0 14.6 74.6 51 12008 15.9 59.2 29 11.3 12.4 76.3 47 12008 15.9 59.2 29 11.3 12.4 76.3 47 12008 15.9 59.2 29 11.2 11.8 74.1 46 12008 17.6 59.8 31 12.8 11.8 74.1 46 12008 17.6 59.8 31 12.8 11.8 74.1 46 12008 17.6 59.8 31 12.8 11.8 74.1 46 12008 17.6 60.8 31 12.1 11.3 74.1 55 12008 17.6 60.8 31 11.4 10.4 75.3 3.44		••	Bromate	: Loaf :Crumb: Grain :/olume:Color:Texture	: Grain Texture
Sask. 2176 12639 21.6 60.5 31 14.8 14.5 75.7 15.0 18.9 18.5 32.4 12643 23.2 59.6 35 15.7 15.0 73.9 18.5 32.4 12643 23.2 59.6 35 15.7 15.0 73.9 18.5 21.1 12733 23.3 61.0 37 15.5 16.1 77.9 12273 23.3 61.0 37 15.5 15.1 77.9 12273 23.9 59.8 33 16.2 15.1 77.9 12488 123.9 59.8 33 16.2 15.1 77.9 12488 12.9 59.8 33 16.2 15.1 77.9 12488 12.9 59.8 33 16.2 15.1 77.9 1248 12.9 23.6 60.0 25 15.1 14.1 72.6 17.0 20.0 20.9 60.1 26 14.2 13.7 72.6 17.0 20.0 20.9 60.1 26 14.2 13.7 72.6 17.0 20.0 20.9 60.1 26 14.2 14.0 76.7 65.0 1003 24.2 59.3 28 14.4 14.2 75.4 1003 24.2 59.3 28 14.4 14.2 75.4 12.0 20.1 12.0 2.6 14.2 13.9 14.0 74.1 12.0 2.0 12.2 2.7 59.8 61.8 32 14.4 14.2 75.7 75.4 12.0 2.0 12.2 2.7 59.8 61.8 32 14.4 14.2 76.7 12.0 2.0 12.2 2.0 60.1 26 14.3 14.0 74.6 74.6 12.2 12.2 2.0 12.2 12.2 2.0 60.1 26 14.3 12.2 14.0 74.6 14.2 12.2 12.2 2.0 12.2 12.2 16.9 60.1 31 12.2 11.2 75.1 11.2 12.2 11.2 11.2 11.2 11.2 11.2 1		• Min•	Mg.	Cc Score	Score
NN 2211 12733 23.3 59.6 35 15.7 15.0 73.9 NN 2211 12733 23.3 59.2 32 16.7 16.4 74.0 12246 21.6 60.0 35 14.6 14.2 74.7 12248 23.9 59.8 33 16.0 15.7 72.9 12248 23.9 59.8 33 16.0 15.7 72.9 12248 23.9 59.8 33 16.0 15.7 72.9 12248 23.9 59.8 33 16.0 15.7 72.9 12248 23.9 59.8 33 16.0 15.7 72.9 12249 27.2 59.5 33 16.2 15.7 72.9 12249 27.2 59.5 33 16.2 15.7 72.9 12008 24.5 60.1 26 14.2 13.8 74.9 12008 24.5 60.1 26 14.2 13.8 74.9 12008 24.5 61.1 32 14.0 76.2 12008 24.6 61.1 32 14.0 76.2 12008 24.6 61.1 32 14.0 76.2 12009 20.9 60.1 26 14.2 13.8 74.9 12053 20.1 58.0 26 14.6 74.6 74.1 Eureka, South Dakota 12245 15.9 60.1 31 12.2 71.8 12095 15.9 60.1 31 12.5 11.8 78.3 12202 12273 16.9 60.1 31 12.5 11.8 78.3 12202 12273 16.9 60.1 31 12.5 11.8 74.3 12003 17.6 59.8 31 12.8 11.8 74.3 12008 17.6 60.8 31 12.8 11.8 74.3 12008 17.6 60.8 31 11.4 10.4 75.3		2.5	2	06 996	80
Mil 2211 12733 23.3 59.2 32 16.7 16.4 74.0 12495 21.6 60.0 35 14.6 14.3 74.7 12486 23.3 61.0 37 15.5 12.3 72.3 12488 23.3 59.8 33 16.0 15.7 72.9 12488 23.9 59.8 33 16.0 15.7 72.9 12481 12787 27.2 59.5 29 14.5 13.7 72.0 12482 23.6 60.0 25 15.1 13.6 72.3 12483 23.6 60.1 26 14.2 13.8 74.9 12508 24.6 61.1 32 15.0 14.6 75.4 12508 24.6 61.1 32 15.0 14.6 75.4 12508 24.6 61.1 32 15.0 14.6 75.4 12508 24.6 61.1 32 14.2 13.8 74.9 12527 59.8 14.3 14.0 74.1 22.7 59.8 31 15.0 14.6 74.6 12527 59.8 31 15.0 14.6 74.6 12528 65.0 25.0 16.1 60.5 32 13.9 13.0 71.3 2207 12523 16.9 60.1 31 12.4 73.6 12605 12625 16.1 60.5 32 13.9 13.0 71.3 2202 12273 16.9 60.1 31 12.4 73.6 12606 17.6 60.8 31 12.8 11.8 74.3 12607 14.6 58.8 24 12.3 11.6 72.9 12608 15.9 60.8 31 12.8 11.8 74.3 12608 15.9 60.8 31 12.8 11.8 74.3 12608 15.9 60.8 31 12.8 11.8 74.3 12608 15.9 60.8 31 12.8 11.8 74.3 12608 17.6 60.8 31 11.4 10.4 75.3					8
12496 21.6 60.0 35 14.6 14.3 74.7 12273 23.3 61.0 37 15.5 15.1 77.9 12435 15.0 59.8 33 16.0 15.7 72.9 12485 15.0 59.8 33 16.2 15.1 77.9 12486 12787 27.2 59.5 33 16.2 15.7 72.9 12495 12493 23.6 60.0 25 15.1 14.1 72.6 12700 20.9 60.1 26 14.3 14.0 76.2 12003 24.2 59.3 28 14.6 14.2 73.9 12702 28.8 61.8 32 14.4 14.2 73.9 12072 28.8 61.8 32 14.4 14.2 75.4 12053 20.1 58.0 26 14.3 14.0 74.1 2207 12625 16.1 60.5 32 13.3 12.4 73.6 12704 16.3 60.6 34 13.2 12.4 75.3 12045 14.5 57.7 24 13.2 12.4 73.6 12086 15.9 60.6 34 13.1 12.4 75.3 12488 15.9 60.6 34 13.1 12.4 75.3 12003 17.4 59.5 24 12.1 11.8 74.1 12003 17.4 59.5 24 12.1 10.4 75.3 12003 17.6 60.8 31 11.4 10.4 75.3 12006 17.6 60.8 31 11.4 10.4 75.3 12007 17008 17.6 60.8 31 11.4 10.4 75.3 12008 17.6 60.8 31 11.4 10.4 75.3 12008 17.6 60.8 31 11.4 10.4 75.3 12008 17.6 60.8 31 11.4 10.4 75.3 12008 17.6 60.8 31 11.4 10.4 75.3 1208 17.6 60.8 31 11.4 10.4 75.3 1208 17.6 60.8 31 11.4 10.4 75.3 1208 17.6 60.8 31 11.4 10.4 75.3 1208 17.6 60.8 31 11.4 10.4 75.3 1208 17.6 60.8 31 11.4 10.4 75.3 1208 17.6 60.8 31 11.4 10.4 75.3 1208 17.6 60.8 31 11.4 10.4 75.3 1208 17.6 60.8 31 11.4 10.4 75.3 1208 17.6 60.8 31 11.4 10.4 75.3 1208 17.6 60.8 31 11.4 10.4 75.3 1208 17.6 60.8 31 11.4 10.4 75.3 1208 17.6 60.8 31 11.4 10.4 75.3 1208 1708 1708 1708 1708 1708 1708 1208 1708 1708 1708 1708 1708 1208 1708 1708 1708 1708 1708 1708 1208 1208 1708 1708 1					82
12273 23,3 61,0 37 15,5 15,1 77,9 12435 15,0 57,5 28 14,1 13,6 72,3 12486 23,9 59,8 33 16,0 15,7 72,9 11945 16,8 58,5 29 14,5 15,7 73,0 11945 16,8 58,5 29 14,5 15,7 73,0 11945 1273 23,6 60,0 25 15,1 14,1 76,6 11708 24,5 60,1 30 14,2 13,8 74,9 12008 24,6 61,1 32 15,0 14,6 74,2 12008 24,6 61,1 32 15,0 14,6 74,2 12008 24,6 61,1 32 14,4 14,2 76,7 12053 20,1 58,0 26 14,3 14,0 74,1 12053 20,1 58,0 26 14,3 14,0 74,1 12053 12,8 4,3 12 2,6 2,8 5,6 12625 16,1 60,5 32 13,9 13,0 71,3 12048 15,9 60,1 31 12,5 11,8 78,3 12045 14,5 57,7 24 13,2 12,4 76,3 12003 17,4 59,5 24 12,3 11,8 74,1 12003 17,4 59,5 24 12,1 11,3 74,1 12003 17,4 59,5 24 12,1 11,3 74,1 12006 17,6 60,8 31 11,4 10,4 75,3 12006 17,6 60,8 31 11,4 10,4 10,4 10,4 10,4 10,4 10,4 10,		2.5		923 100	82
12435 15.0 57.5 28 14.1 13.6 72.3 12488 23.9 59.8 33 16.0 15.7 72.9 11945 16.8 58.5 29 14.5 13.7 73.0 11945 16.8 58.5 29 14.5 13.7 73.0 11945 16.8 58.5 29 14.5 13.7 73.0 12708 24.6 60.1 26 14.2 13.8 74.9 12008 24.6 61.1 32 15.0 14.6 74.6 74.6 12008 24.6 61.1 32 15.0 14.6 74.6 74.0 12003 24.2 59.3 28 14.6 14.2 73.9 12772 28.8 61.8 32 14.4 14.2 75.4 74.1 12053 20.1 58.0 26 14.3 14.0 74.1 2202 12625 16.1 60.5 32 13.3 12.2 74.8 24.6 13.0 74.8 25.6 12.3 11.6 74.6 14.5 14.6 14.6 74.6 14.6				3	06
12486 23.9 59.8 33 16.0 15.7 72.9 11945 16.8 58.5 29 14.5 13.7 73.0 11945 16.8 58.5 29 14.5 13.7 73.0 11945 1273 23.6 60.0 25 15.1 14.1 72.6 12002 24.6 61.1 32 14.6 14.2 75.4 1003 24.2 59.3 28 14.6 14.2 75.4 12008 24.6 61.1 32 15.0 14.6 75.4 12008 24.6 61.8 32 14.6 14.2 75.4 12008 24.6 61.8 32 14.6 14.2 75.4 12008 24.6 26.3 26 14.3 14.0 74.1 220.7 28.8 61.8 32 14.4 14.2 76.7 22.7 59.8 31 15.0 14.6 74.6 22.7 59.8 31 15.0 14.6 74.6 22.7 59.8 31 15.0 14.6 74.6 22.7 59.8 31 15.0 14.6 74.6 22.7 22.7 29.8 31 15.0 14.6 74.6 22.7 20.2 12.2 13.8 78.3 22.2 20.1 20.2 20.1 20.9 76.5 60.0 31 12.5 11.8 78.3 22.7 24.6 22.6 22.8 26.1 22.4 76.3 22.0 22.0 22.0 22.0 22.4 22.1 22.4 76.3 22.0 22.0 22.0 22.4 22.1 22.4 76.3 22.0 22.0 22.0 22.4 22.1 22.4 22.4 22.1 22.8 22.0 22.4 22.1 22.4 22.1 22.0 22.	.48 63				85
NS. 3681 12787 27.2 59.5 33 16.2 13.7 73.0 NN 2012 12493 23.6 60.0 25 15.1 14.1 72.6 11708 24.5 60.1 30 14.3 14.0 76.2 16900 20.9 60.1 30 14.3 14.0 76.2 12008 24.6 61.1 32 15.0 14.6 74.9 12008 24.2 59.3 28 14.6 14.2 76.7 12053 20.1 58.0 26 14.3 14.0 74.1 2217 28.8 61.8 32 14.4 14.2 76.7 12053 20.1 58.0 26 14.3 14.0 74.1 221 12.6 4.3 12.2 13.9 14.0 74.1 2207 59.8 31 15.0 14.6 74.6 2207 59.8 31 15.0 14.6 74.6 2208 12625 16.1 60.5 32 13.9 13.0 71.3 2202 12731 16.3 60.6 34 13.1 12.4 76.3 12045 14.5 57.7 24 13.2 12.4 76.3 12045 14.5 57.7 24 13.2 12.4 76.3 12008 17.4 59.5 24 12.3 11.8 78.3 12008 17.4 59.5 24 12.1 11.3 74.1 12008 17.6 60.8 31 11.4 10.4 75.3			2		6
NS. 3681 12787 27.2 59.5 33 16.2 15.7 75.4 NN 2012 12493 23.6 60.0 25 15.1 14.1 72.6 11708 24.5 60.1 30 14.2 13.8 74.9 12008 24.6 61.1 32 15.0 14.6 75.4 1003 24.2 59.3 28 14.6 14.2 75.4 12008 24.2 59.3 28 14.6 14.2 75.4 12053 20.1 58.0 26 14.3 14.0 74.1 12053 20.1 58.0 26 14.3 14.0 74.1 12053 20.1 58.0 26 14.3 14.0 74.1 12053 20.1 58.0 26 14.3 14.0 74.1 12053 20.1 58.0 26 14.3 17.0 74.1 12053 20.1 58.0 26 14.3 17.0 74.1 12053 17.3 59.0 32 13.9 13.0 71.3 12272 1273 16.9 60.1 31 12.5 11.8 78.3 12275 1273 16.9 60.1 31 12.5 11.8 78.3 12275 1277 59.8 31 12.5 11.8 78.3 12275 1277 59.8 31 12.5 11.8 78.3 12275 1277 59.8 24 13.1 12.4 76.3 12078 15.9 60.8 31 12.8 11.8 74.1 12008 17.4 59.5 24 12.1 11.3 74.1 12008 17.4 59.5 24 12.1 11.3 74.1				903 80	8
MN 2012 12493 23.6 60.0 25 15.1 14.1 72.6 11708 24.5 60.1 30 14.3 14.0 76.2 6900 20.9 60.1 26 14.2 13.8 74.9 12008 24.6 61.1 32 15.0 14.6 75.4 12053 20.1 58.0 26 14.3 14.0 75.1 12053 20.1 58.0 26 14.4 14.2 75.7 12053 20.1 58.0 26 14.4 14.2 76.7 12053 20.1 58.0 26 14.3 14.0 74.1 22.7 59.8 31 15.0 14.6 74.6 12.8 4.3 12 2.6 2.8 5.6 12.7 59.8 31 12.6 74.6 12.8 630 12.6 60.1 31 12.5 11.8 78.3 12.9 12.7 16.9 60.1 31 12.5 11.8 78.3 12.4 16.9 60.1 31 12.5 11.8 78.3 12.4 16.9 60.1 31 12.5 11.8 78.3 11.0 12.4 5 59.2 29 11.9 70.9 76.5 6900 14.6 58.8 24 12.3 11.6 72.9 12003 17.4 59.5 24 12.1 11.3 74.1 12008 17.6 60.8 31 11.4 10.4 75.3			2		06
1708 24.5 60.1 30 14.3 14.0 76.2 1808 24.6 61.1 32 15.0 14.2 13.8 74.9 1808 24.6 61.1 32 15.0 14.6 75.4 1809 24.2 59.3 28 14.6 14.2 73.9 1809 24.2 59.3 28 14.6 14.2 73.9 1809 24.2 59.3 28 14.6 74.2 75.7 1809 22.7 28.8 61.8 32 14.4 14.2 76.7 1809 22.7 59.8 31 15.0 14.6 74.6 1809 12.2 12.8 4.3 12 2.6 2.8 5.6 1809 12.6 12.3 16.3 60.5 32 13.9 13.0 71.8 1809 12.6 12.3 16.3 60.6 34 13.1 12.4 76.3 1809 12.6 12.8 13.8 13.8 73.8 1809 12.6 12.8 13.8 13.8 73.8 1809 1809 1809 1809 1809 76.5 1809 1809 1809 1809 1809 1809 76.5 1809 1800 1800 1800 1800 1800 1800 1809 1809 1800 1800 1800 1800 1809 1809 1800 1800 1800 1809 1809 1800 1800 1800 1809 1800 1800 1800 1800 1800 1800 1800 1800 1800		2.5			06
s 6900 20.9 60.1 26 14.2 13.8 74.9 cher 12008 24.6 61.1 32 15.0 14.6 75.4 eton 12072 28.8 61.8 32 14.6 14.2 73.9 eton 12073 24.2 59.3 28 14.6 14.2 73.9 age 12073 20.1 58.0 26 14.3 14.0 74.1 age 22.7 59.8 31 15.0 14.6 74.6 age 22.7 59.8 31 15.0 14.6 74.6 age 22.1 22.7 59.8 31 15.0 14.6 74.6 anove 32.2 32.3 12.2 32 32.3 13.3 12.2 33.3 33.3 33.3 33.3 33.3 33.3 33.3 33.3 33.3 33.3 33.3 33.3 33.3 33.3 33.3 33.3 <th< th=""><td>.57 70</td><td></td><td>2 8</td><td>896 85</td><td>82</td></th<>	.57 70		2 8	896 85	82
cher cher 12008 24.6 61.1 32 15.0 14.6 75.4 eton 12772 28.8 61.8 32 14.4 14.2 73.9 age 22.7 59.8 31 15.0 14.6 74.1 age 22.7 59.8 31 15.0 14.6 74.1 age 22.7 59.8 31 15.0 14.6 74.1 age 22.7 59.8 31 15.0 14.6 74.6 age 22.7 22.7 24 13.2 17.3 b. x Clarendon 2202 12731 16.9 60.6 34 13.1 12.4 76.3 c. x Clarendon 2202 12731 16.9 60.6 34 13.1 12.4 76.3 age 24 12.3 11.6 72.9 b. x Clarendon 1945 15.0 59.8 26 11.4 10.4 74.1 c. x Clarendon 1945 15.0 59.8 26 11.4 10.4 74.1 c. x Clarendon 100003 17.4 59.5 24 12.1 11.3 74.1 c. x Clarendon 10.0 17.6 60.8 31 11.4 10.4 75.3 c. x Clarendon 10.0 17.6 60.8 31 11.4 10.4 75.3 c. x Clarendon 10.0 17.6 60.8 31 11.4 10.4 75.3 c. x Clarendon 10.0 17.6 60.8 31 11.4 10.4 75.3 c. x Clarendon 10.0 17.6 60.8 31 11.4 10.4 75.3 c. x Clarendon 10.0 17.6 60.8 31 11.4 10.4 75.3 c. x Clarendon 10.0 17.6 60.8 31 11.4 10.4 75.3 c. x Clarendon 10.0 17.6 60.8 31 11.4 10.4 75.3 c. x Clarendon 10.0 10.0 10.0 c. x Henry 10.0 10.0 10.0 c. x Henry 10.0 10.0 10.0 c. x Henry 10.0 10.0 c. x					96
cher loo3 24.2 59.3 28 14.6 14.2 73.9 eton eton 12772 28.8 61.8 32 14.4 14.2 76.7 12.05 20.1 58.0 26 14.3 14.0 74.1 age 22.7 59.8 31 15.0 14.6 74.6 74.6 14.0 x Thatcher 630 12625 16.1 60.5 32 13.3 12.2 71.8 10.9 12273 16.9 60.1 31 12.5 11.8 78.3 12.0 71.3 17.00 14.6 58.8 24 13.2 12.4 76.3 11.0003 17.4 59.5 24 12.1 11.3 74.1 10.00 17.0 50.8 31 11.4 10.4 75.3 11.00 17.0 50.8 31 11.4 10.4 75.3			2 8		80
x Henry x Henry x Clarendon 2202 x Clarendon 2203 x Clarendon 2204 x Clarendon 2202 x Clarendon 2202 x Clarendon 2203 x Clarendon x Clarendon 2204 x Clarendon 2205 x Clarendon x C		2.0	2	162 70	90
## Henry	_		8 .T	853 75	80
x Henry x Henry x Clarendon 220,7 59,8 31 12,6 4,3 12 Eureka, South Dakota Eureka, South Dakota 12733 17,3 59,0 32 13,9 12,6 12731 16,9 60,0 12,5 12,6 12,6 12,6 12,6 12,7 13,1 12,7 13,1 12,7 13,1 12,7 13,1 12,7 13,1 12,7 13,1 12,7 13,1 12,7 13,1 12,7 13,0 13,1 12,7 13,0 13,1 12,7 13,0 13,1 12,7 13,0 13,1 13		2.5	8	42 80	06
x Henry x Henry x Clarendon 220.7 y x Clarendon 220.8 31 120.8 x Henry Henry x Henry x Henry x Henry x Henry x Henry x Henry x Henry x Henry x Henry x Henry x Henry x He				4	
x Henry x Henry x Henry x Henry x Clarendon 22211 12733 17.3 59.0 32 13.9 13.0 71.3 more 12.02 12731 16.9 60.01 31 12.5 11.8 78.3 12.04 12.04 12.04 12.04 12.04 12.04 12.05 12.04 12.04 12.08 12.04 12.08 12.08 12.08 12.08 12.09	.51				87
x Henry x Henry c 2211 c 2221 c 2223 c 2233 c 2223 c 2233 c 2234 c 2233 c 2234 c 2233 c 2234 c 2233 c 2234 c 2233 c 2233 c 2234 c 2233 c 2234 c 2233 c 2234 c 2233 c 2234 c 234	1.0	2 1	124 30	10	
x Henry x Henry 2211 12733 17.3 59.0 32 13.9 13.0 71.3 more P. x Clarendon 2202 12073 16.9 60.1 31 12.5 12.0 13.0					
x Henry nfo x Thatcher 630 12625 16.1 60.5 32 13.9 13.0 71.3 more P. x Clarendon 2202 12731 16.9 60.1 31 12.5 11.8 78.3 17.4 15.9 12.7 16.9 12.7 16.9 12.7 16.9 12.7 16.9 12.7 16.9 12.7 16.9 12.4 13.0 12.7 16.9 12.7 16.9 12.4 13.0 12.7 16.9 12.4 13.0 12.4 13.0 12.4 13.0 12.4 13.0 12.4 13.0 12.4 13.0 12.4 13.0 12.4 13.1 12.4 13.1 12.0 13.1 13.2 13.9 13.0 13.0 13.0 13.0 13.0 13.0 13.0 13.0		·		. :	
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nfo x Thatcher 630 12625 16.9 60.5 32 13.3 12.2 71.8 P. x Clarendon 2202 12731 16.9 60.1 31 12.5 11.8 78.3 I. x Clarendon 2202 12731 16.9 60.6 34 13.1 12.4 76.3 I. 1 1 2 4 13.1 12.4 76.3 I. 1 1 2 2 1 3.2 12.4 76.3 6 1 2 5 2 2 1 2 7 2 7 3.6 3 7 3.6 3 3 3 3 3 3 3 3 3 4 3 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 3 4 3 3 3 3 3		2.5	6	856 85	06
P. x Clarendon 2202 12731 16,9 60,1 31 12,5 11,8 78,3 12,4 x Clarendon 2202 12731 16,3 60,6 34 13,1 12,4 76,3 12,4 13,1 12,4 76,3 11,0 12,4 13,2 12,4 73,6 11,0 12,9 12,9 11,9 10,9 76,5 6900 14,6 58,8 24 12,3 11,6 72,9 12,48 15,9 60,8 31 12,8 11,8 74,3 11,945 15,0 59,8 26 11,4 10,4 74,1 10,003 17,4 59,5 24 12,1 11,3 74,1 12,008 17,6 60,8 31 11,4 10,4 75,3					8
F. x Clarendon 2202 12731 16,3 60,6 34 13,1 12,4 76,3 12045 14,5 57,7 24 13,2 12,4 73,6 1708 15,9 59,2 29 11,9 10,9 76,5 6900 14,6 58,8 24 12,3 11,6 72,9 12488 15,9 60,8 31 12,8 11,8 74,3 11945 15,0 59,8 26 11,4 10,4 74,1 10,003 17,4 59,5 24 12,1 11,3 74,1 12,008 17,6 60,8 31 11,4 10,4 75,3	*20 e0		0 7	786 80	06
12045 14.5 57.7 24 13.2 12.4 73.6 11708 15.9 59.2 29 11.9 10.9 76.5 6900 14.6 58.8 24 12.3 11.6 72.9 12488 15.9 60.8 31 12.8 11.8 74.3 11945 15.0 59.8 26 11.4 10.4 74.1 12008 17.4 59.5 24 12.1 11.3 74.1 12008 17.6 60.8 31 11.4 10.4 75.3				•	8
11708 15,9 59,2 29 11,9 10,9 76,5 6900 14,6 58,8 24 12,3 11,6 72,9 12488 15,9 60,8 31 12,8 11,8 74,3 11945 15,0 59,8 26 11,4 10,4 74,1 10003 17,4 59,5 24 12,1 11,3 74,1 12008 17,6 60,8 31 11,4 10,4 75,3				28 90	06
6900 14.6 58.8 24 12.3 11.6 72.9 12488 15.9 60.8 31 12.8 11.8 74.3 11945 15.0 59.8 26 11.4 10.4 74.1 10003 17.4 59.5 24 12.1 11.3 74.1 12008 17.6 60.8 31 11.4 10.4 75.3					06
t. 12488 15.9 60.8 31 12.8 11.8 74.3 11945 15.0 59.8 26 11.4 10.4 74.1 10003 17.4 59.5 24 12.1 11.3 74.1 12008 17.6 60.8 31 11.4 10.4 75.3					8
the sher 11945 15.0 59.8 26 11.4 10.4 74.1 10.003 17.4 59.5 24 12.1 11.3 74.1 12.008 17.6 60.8 31 11.4 10.4 75.3				35 90	06
12008 17.6 60.8 31 11.4 10.4 75.3				. •	92
12008 17.6 60.8 31 11.4 10.4 75.3					8
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ge 16,1 59,7 29 12,5 11,7	.47 61		.36 7		88
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Brookings, S	į

Table 3.--Continued.

Cross	: State or	:C. I.:Acre	Acre:	Test :	ing					-drosq	:Absorp-:Mixing:		1)	Danting Me mous
		. No.	771	:Veight:Index		Wheat Flour Yield	Tlour 1		Ash	tion	Time	Proma te	Loaf Volume	:Color:Texture	Grain Pexture
			Bu.	Lbs.	Pct.	Pet.	Pot.	Pct. F	Pct.	Pot.	Min.	Mg.	: 20	Score	Score
Triunfo x Thatcher	089	12625	31.6	61.4	31	14.9	13.5	72.0	.43	09	2.0	٦	945	06	80
1764 x Henry	2211	12733	29.3	59,1	56	13.6	13.0	72.1	44	99	0°6	r{	848	82	06
Redman		12496	26.2	58.2	28	13,3	12.8	75.0	•46	2	0 0	ä	812	82	8
Triunfo x Thatcher	343	12497	30.1	61.8	36	14.1	13.0	72.7	64.9	9	ان در	2	815	8	80
Lee		12488	32.8	61.5	28	14.0	13,3	75.4	.45	29	ກຸ	0	803	32	95
H.R.P. x Clarendon	1001	12723	22.0	61.8	38	14.1	13.0	73.7	•43	9	2.0	, 	795	8	8
H.R.P. x Clarendon	2202	12731	32,4	61.5	34	13.5	12,9	77.4	.40	9	2.0	~	787-	06	00
Cadet		12045	25.4	58.5	23	13.0	12,1	72,3	•55	99	3.0	2	781	80	80
Pilot		11945	25.4	58.9	23	12.9	11.7	73.6	47	62	2.5	0	772	2	80
Rushmore		12273	27.7	8.09	53	13.1	12.5	75.9	48	62	0.4	2	758	80	82
Thatcher		10003	56.9	20.0	23	12,6	11.8	73.8	64.	49	3.0	~	747	75	82
Mida		12008	30.8	61.5	56	12.2	11.2	75.5	.49	2	2,5	0	732	05	06
Rival		11708	28.1	60.1	24	12,1	11.5	77.4	.52	63	4.0	2	732	75	82
Ceres		0069	26.5	59.1	22	12,0	11.0	72.7	44	2	3.0	0	729	2	85
Average			28.4	60.2	28	13.2	12,4	74.3	47	63	2.8	-	250	83	88
Range	,		7.8	3.6	16	2.9	2.5	5.4	.12	7	2.5	0	516	20	15
				四	Highmore,		South Dakota	4 1				٠			
1764 x Henry	2211	12733	12.5	59.4	30	15.8	15.4	73.4	.48	29	3.0		1010	85	06
Thatcher		10003	11,3	8.09	27	15.5	15.0	72.9	.46	99	3,0	~	1009	95	8
Rushmore		12273	12.6	60.4	31	15.7	15.0	75.9	849	2	ລຸກ	Ч	959	8	80
Triunfo x Thatcher	630	12625	ල ල	60.5	32	16.0	15.2	73.0	•57	62	J.5	2	945	82	80
Lee		12438	10,4	0°19	30	16,1	15.2	72,3	.50	99	3.0	0	940	50	92
Rival		11708	11.7	800	56	15,3	14.4	76.0	574	65	ຕຸ້ນ	r-1 :	917	06	8 i
H.R.P. x Clarendon	2202	12731	13.0	9*19	31	12.1	14.6	76.7	4.	62	2.0	1 ı	917	95	က္ဆ
Filot		11945	13°1	50°4	3 !	10.3	14.2	0.0	ر ا	g (O C	-1 (276	5 F	S 6
Ceres		0069	14.0	61.9	27	15.0	14.5	67.7	10°	69	O 10	> (900	٠ د ا	ک ا ا
Cadet		12045	12,1	59.5	24	14.9	14.1	72.6	.53	69	ອຸນ	2	871	95	င္သ
Mida		12008	12.2	61.9	28	15.0	14.1	74.9	51	2	2.5	 1	820	92	06
Average			12.3	60.7	28	4	14.7	73.3	.50	65	2.8	1	931	06	87
Range			5.3	2.5	α α	1.5	F. 4	0.6	13	7	2.0	2	160	20	15
												,			

Table 3 .-- Continued.

Havre, Montana

i. N. No. Yield-Height-Index: Meat. Figure: Table : tion : Time :	Variety or	: State or	.C. I. Acre	Acre	Test Test	: Pearl-	Protein	in:	Flour		bsorp	: Absorp-:Wixing:		Optimum Baking Wethods	ring Met	spoq
12435 18,6 24,6 31 17,4 17,0 17,0 25,6 3.5 3.5 1.066 75 13445 18,6 34,6 34,6 31,0 17,0 32,6 3.5 3.5 1.066 75 13445 18,6 34,6 34,6 31,7 16,1 69,0 32,6 3.5 3.5 1.066 75 13445 18,6 34,6 34,6 34,7 34,7 34,7 36,6 3.5 3.5 3.5 3.5 3.5 3.5 13445 18,6 34,6 34,6 34,7	Cross		No.	Yield:	Weight:		Wheat	lour		1	tion	Time	Bromate	: Loaf :Volume	:Color	Grain Texture
12435 18.6 54.6 31 17.4 17.0 71.0 .52 65 34.0 1 1068 70 13452 18.7 55.8 3.4 25 16.8 16.1 69.0 .48 65 34.0 1 1035 90 13452 18.7 58.8 30 17.6 16.9 72.2 30 66 34.0 1 1035 90 12003 10.5 55.6 28 17.1 16.6 72.3 .56 66 34.0 1 995 90 12003 10.5 55.6 28 17.1 16.6 72.3 .56 66 34.0 1 995 90 12003 10.5 55.6 28 16.4 17.5 .88 68 34.5 2 10.995 90 12003 10.5 56.6 28 16.4 15.8 10.4 34 66 83.5 1 995 90 12003 10.5 56.6 28 16.1 15.1 71.5 .58 68 34.5 2 10.995 90 12003 10.5 56.6 28 16.1 15.1 71.5 .58 68 34.5 2 10.995 90 12003 10.5 56.6 28 16.1 15.1 71.8 .57 7.2 .58 84.5 2 10.995 90 12003 10.5 56.6 28 16.1 15.8 71.2 .52 67 34.5 1 909 90 12003 10.5 56.6 28 16.1 15.8 71.2 .52 67 34.5 1 909 90 12003 10.5 56.6 28 16.1 15.1 71.8 .55 72.3 .44 63 2.5 2 899 90 12003 10.5 56.6 28 16.1 15.1 71.8 .55 72.3 .44 63 2.5 2 899 90 12003 10.5 56.6 28 16.1 15.1 71.8 .55 72.3 .44 63 2.5 2 899 90 12003 10.5 56.6 28 16.1 15.1 71.8 .55 72.3 .44 63 2.5 2 899 90 12003 10.5 56.6 28 16.1 16.1 16.1 16.1 16.1 16.1 16.1 16.				В.	Lbs.	Pct.	1	Sct.		ct.	Pct.	Min.	• B M	ပ္ပ	Score	Soore
Hard	Rescuie		12435	18.6	54.6	31	17,4	17.0	71.0	.52	65	3.0	Н	1068	20	80
## 10003 20.3 53.4 55 17.0 16.6 6.9 72.2 50 66 3.0 1 1035 90 ***Pilot** ***Pilot** ***INGA** **	Pilot		11945	21.5	52.8	22	16.8	16.1	. 0.69	.48	65	3,5	2	1066	75	80
10003 20,3 33,4 25 17,0 16,1 68,8 .50 67 3,5 1 1007 70	Reverd		8182	18.7	58.8	30	17.6	16.9	72.2	.50	99	3°0	Н	1035	06	80
12053 17.5 56.6 28 17.1 16.6 72.3 .56 66 3.0 1 995 80	Thatcher		10003	20,3	53,4	52	17.0	16.1	. 8.89	•50	29	3.5	rH	1001	2	80
12653 19.3 53.6 25 16.8 15.4 71.5 5.56 68 3.5 19.9 59.0 12662 20.7 55.6 23 15.4 15.4 71.9 5.4 68 3.5 2 9.1 90.0 12662 20.7 25.6 23 15.4 15.4 72.9 5.4 68 3.5 2 9.1 90.0 12663 12655 20.0 59.2 26 14.7 14.3 72.3 5.4 69 2.5 2 9.1 90.0 12663 12655 20.0 59.2 26 14.7 14.3 72.3 5.4 69 2.5 2 9.1 90.0 12663 12655 20.0 59.2 2 14.7 14.3 72.3 5.4 69 2.5 2 9.1 90.0 12664 12655 20.0 59.2 2 14.7 14.3 71.8 55 67 3.5 1 91.5 95.0 12665 12665 12665 12665 14.7 14.3 14.2 14.5 14.0 7 14.0 15.5 1 90.0 12665 12	Mercuis		3641	17.5	56.6	28	17.1	16.6	72.3	•56	99	3.0	~	995	80	80
## BOOCE 50.7 55.0 27 15.8 15.1 71.9 49 66 3.5 3 9 18 951 85 85 85 85 85 85 85 85 85 85 85 85 85	Cadet		12053	19,3	53.6	52	16.8	16.4	71.5	.58	69	വ പ	-1	926	90	82
## Pilot 1860 19.5 55.6 23 16.4 15.8 70.4 34 70 3.5 1 923 80 x Mida 1953 12495 20.2 55.6 26 16.1 15.3 70.6 346 68 3.5 2 910 80 x Mida 1953 12495 20.0 54.0 27.8 27.1 14.1 72.3 44 63 2.5 2 910 80 ge	Supreme		8026	20.7	55.0	27	15.8	15.1	71.9	.49	99	3,5	m	951	82	82
12468 12352 20,1 54,6 28 16,1 15,6 72,9 52 68 3,5 2 910 90 x Mida	Ceres		0069	19.5	56.5	23	16,4	15.8	70.4	¥.	20	3,5	,- 1	923	80	82
Name	Lee		12488	20.2	56.6	28	10,1	15.6	72.9	.52	99	3,5	2	916	8	8
## Nida 1953 12455 20,0 59,2 26 14,7 14,1 72,3 44 63 2,5 2 2 859 85 12008 18,9 57,8 27 14,7 14,3 71,8 55 67 3,3 1.50 958 82 24,0 6,4 9 2,9 2,9 4,1 10 7 1,0 2 258 20 25,0 2,9 2,9 4,1 10 7 1,0 2 258 20 25,0 2,9 2,9 4,1 10 7 1,0 2 258 20 25,0 2,9 2,9 4,1 10 7 1,0 2 258 20 25,0 2,9 2,9 4,1 10 7 1,0 2 258 20 25,0 2,9 2,9 2,1 4,7 4,4 1,4	Merit x Pilot	1860	12355	20.1	54.6	25	16,3	15,3	9.07	•54	99	3,5	2	910	80	8
ge 19.6 55.8 26 16.4 15.8 71.2 .52 67 3.5 1 810 90 12435 38.3 62.8 38 14.9 14.5 75.3 .49 63 11.5 1 989 75 8182 29.4 63.5 3.3 14.8 14.0 73.2 .43 64 1.5 1 971 85 1 971 85 1 12098 38.3 62.0 38.3 62.0 31 14.8 14.0 73.2 .43 64 1.5 1 972 86 1 12098 38.3 62.0 31 14.8 14.0 73.2 .43 64 1.5 1 971 85 1 972 86 1 12098 38.3 62.0 31 14.8 14.0 73.2 .43 64 1.5 1 971 85 1 972 86 1 12098 38.3 62.0 31 14.8 14.2 73.0 .51 65 2.0 1 885 75 x kida 1756 12355 36.5 60.9 29 15.3 14.8 14.2 74.2 .52 69 2.0 1 859 85 1 12098 37.6 62.1 33 14.8 14.3 73.3 .49 68 11.5 0 804 75 1 12053 36.1 61.7 28 14.4 13.9 71.7 .49 68 11.5 0 804 75 80 80 80 80 80 80 80 80 80 80 80 80 80	Pilot x Mida	1953	12455	20.0	59.5	56	14.7	14.1	72.3	44	63	2.5	2	828	82	8
19,6 55,8 26 16,4 15,8 71,2 55 67 3,3 1,50 958 82 82 82 84,0	Mida		12008	18.9	57.8	27	14.7	14.3	71.8	•55	29	3.5	- -1	810	90	80
Be Bill S 29.4 63.5 36 16.4 15.8 71.2 52 67 3.3 1.50 958 82 Be Bill S 29.4 63.5 34 16.3 16.0 72.1 47 64 1.5 1 999 75 81 18.5 1 992 80 12485 83.7 63.5 34 16.3 16.0 72.1 47 64 1.5 1 991 895 75 11945 39.2 62.2 31 14.8 14.0 73.1 47 65 2.5 1 999 75 81 18.5 1 991 90 90 12488 38.7 61.5 32 15.4 14.2 13.6 72.1 47 64 1.5 1 991 90 90 12488 38.7 61.5 32 15.4 14.2 13.6 72.1 47 65 2.5 1 999 75 81 18.5 1 900 90 90 12488 38.7 61.5 32 15.4 14.2 13.6 73.4 50 70 3.0 1 895 75 18.5 1900 34.0 12.3 15.4 14.2 13.6 73.4 50 70 2.0 1 895 75 12.0 1 8.5 1 12.0 14.5 13.8 14.8 14.2 73.2 4.4 63.5 11.5 11.5 11.5 11.5 11.5 11.5 11.5 1																
## Moccasin, Montana Moccasin, Motcasia Moccasin, Montana Moccasin, Mo	Average			19.6	55.8	26	16,4	15.8	71.2	.52	. 29	. E.	1.50	958	82	83
12435 38.3 62.8 38 14.9 14.5 75.3 49 63 1.5 1 988 75 1842 29.4 63.5 34 16.3 16.0 72.1 47 64 1.5 1 971 85 1945 39.2 62.2 31 14.8 14.0 73.2 43 64 1.5 1 971 85 1946 38.7 61.5 32 15.4 14.9 74.0 52 72 2.5 1 999 50 1948 38.7 61.5 34 14.7 14.2 73.0 51 65 2.0 1 885 75 1948 38.7 61.5 34 14.7 14.2 73.0 51 65 2.0 1 885 75 1958 36.1 62.2 33 15.4 14.8 74.2 49 64 2.0 1 885 75 x Mida 1756 12303 38.8 63.9 30 14.6 14.1 72.3 47 67 1.5 1 842 85 12008 37.6 62.1 33 14.4 13.9 71.7 49 68 1.5 0 804 75 12053 36.1 61.7 28 14.4 13.9 71.7 49 68 1.5 1 812 85 12053 36.1 61.7 28 14.4 13.9 71.7 49 68 1.5 1 812 85 12053 36.1 61.7 28 14.4 13.9 71.7 49 68 1.5 1 815 20 12053 36.8 63.9 30 12.1 2.4 3.6 31 9 15 1 185 20	:			4.0	6.4	0	5.9	2.9	4.1	970	7	1.0	2	258	2	10
Moccasin, Montana Moccasin, Mocc																
12435 38.3 62.8 38 14.9 14.5 75.3 49 63 1.5 1 989 75 11945 29.4 63.2 31 14.8 14.9 73.2 343 64 1.5 1 971 973 11948 38.7 61.5 32 15.4 14.9 73.2 343 64 1.5 1 973 895 12488 38.7 61.5 32 15.4 14.9 74.0 52 72 2.5 1 909 90 12488 38.7 61.5 32 15.4 14.9 74.0 52 72 2.5 1 909 90 12488 38.7 61.5 32 15.4 14.2 34 50 70 3.0 1 909 90 12585 36.5 60.9 29 15.3 15.4 74.2 3.4 54 54 5.0 1 875 875 12600 38.3 62.5 29 15.3 15.0 14.2 74.2 5.5 69 2.0 1 845 70 12600 38.3 62.5 29 15.0 14.2 74.2 5.5 69 2.0 1 845 70 12600 37.6 62.1 33 14.4 17.2 74.8 3.4 64 1.5 1 812 85 12600 37.6 62.1 33 14.4 13.9 71.7 349 68 1.5 1 812 85 12600 37.6 62.1 33 14.4 13.9 71.7 349 68 1.5 1 815 20 37.1 62.3 32 15.0 14.5 73.5 349 67 1.5 1 815 20 37.1 62.3 32 15.0 14.5 73.5 349 67 1.5 1 815 20 38.8 3.0 3.0 3.0 2.0 2.0 3.				; •		Moco	sin. M	ontana								
12435 38.3 62.8 38				,												
## Bilb	Resoue		12435	38,3	62,8	38	14.9	14.5	75,3	.49	63	1.5	Н	686	75	06
1945 39.2 62.2 31 14.8 14.0 73.2 43 64 1.5 1 928 80 12488 38.7 61.5 32 15.4 14.9 74.0 52 72 2.5 1 909 90 12488 38.7 61.5 32 15.4 14.9 74.0 52 72 2.5 1 909 90 12488 38.3 61.7 34 14.2 13.6 73.4 50 70 3.0 1 885 75 10003 40.1 62.2 33 15.4 14.8 74.2 349 64 2.0 1 870 75 x Pilot 1860 12355 36.5 60.9 29 15.0 14.2 74.2 54 70 2.0 1 859 85 x Mida 1756 12303 38.8 63.9 30 14.6 14.1 72.3 47 67 1.5 1 842 85 12008 37.6 62.1 33 14.8 14.2 74.8 68 1.5 0 804 75 12053 36.1 61.7 28 14.4 13.9 71.7 49 68 1.5 0 804 75 37.1 62.3 32 15.0 14.5 73.5 49 67 1.5 1 185 20 38.3 37.1 62.3 32 15.0 14.5 3.6 11 9 1.5 1 185 20 39.3 30.4 30	Reward		8182	29.4	63.5	34	16,3	16,0	72,1	.47	2	1,5	-	971	82	9
12488 38.7 61.5 32 15.4 14.9 74.0 52 72 2.5 1 909 90 8026 38.3 61.7 34 14.2 13.6 73.4 50 70 3.0 1 901 75 10003 40.1 62.2 33 15.4 14.8 74.2 49 64 2.0 1 870 75 x Pilot 1860 12355 36.5 60.9 29 15.0 14.2 73.4 54 70 2.0 1 870 75 x Mida 1756 12303 38.8 63.9 30 14.6 14.1 72.3 47 67 1.5 1 842 85 12003 37.6 62.1 33 14.8 14.2 74.8 49 63 1.5 1 842 85 12053 36.1 61.7 28 14.4 13.9 71.7 49 68 1.5 0 804 75 37.1 62.3 32 15.0 14.5 73.5 49 67 1.5 1 842 80 6.8 3.0 10 2.1 2.4 3.6 11 9 1.5 1 185 20 3.0	Pilot		11945	39.2	62.2	31	14.8	14.0	73.2	.43	2	1.5	 i	928	80	06
Secondary Seco	Lee		12488	38.7	61.5	32	15,4	14.9	74.0	.52	72	2,5	Н	606	90	82
is 3641 33.3 62.0 31 14.7 14.2 73.0 51 65 2.0 1 885 75 ner 10003 40.1 62.2 33 15.4 14.8 74.2 49 64 2.0 1 870 75 x Filot 1860 12355 36.5 60.9 29 15.0 14.2 74.2 52 69 2.0 1 859 85 x Mida 1756 12303 38.8 63.9 30 14.6 14.1 72.3 47 67 1.5 1 842 85 12008 37.6 62.1 33 14.8 14.2 74.8 49 63 1.5 0 804 75 12053 36.1 61.7 28 14.4 13.9 71.7 49 68 1.5 0 804 75 6.8 3.0 10 2.1 2.4 3.6 11 9 1.5 1 185 20	Supreme		8026	38.3	61.7	34	14.2	13.6	73.4	.50	20	3.0	Н	901	75	82
ner 10003 40.1 62.2 33 15.4 14.8 74.2 49 64 2.0 1 873 75 x Pilot 1860 12355 36.5 60.9 29 15.0 14.2 74.2 55 69 2.0 1 859 85 x Mide 1756 12303 38.8 63.9 30 14.6 14.1 72.3 47 67 1.5 1 845 85 x Mide 1756 12303 38.8 63.9 30 14.6 14.1 72.3 47 67 1.5 1 842 85 12008 37.6 62.1 33 14.8 14.2 74.8 49 63 1.5 1 812 85 36 37.1 62.3 36.1 61.7 28 14.4 13.9 71.7 49 68 1.5 0 804 75 36 37.1 62.3 32.0 10.2 2.1 2.4 3.6 11.9 9 1.5 1 185 20	Marquis		3641	33.3	62.0	31	14.7	14.2	73.0	.51	65	2.0	႕	882	75	82
x Mida	Thatcher		10003	40.1	62.2	93 93	15.4	14.8	74.2	.49 .1	2 i	0 0	r-1 r	870	75	က္က ပ
x Mida 1756 12303 38.8 63.9 30 14.6 14.1 72.3 47 67 1.5 1 842 85 70 12008 37.6 62.1 33 14.8 14.2 74.8 49 63 1.5 1 812 85 12053 36.1 61.7 28 14.4 13.9 71.7 49 68 1.5 0 804 75 35 49 67 1.5 1 812 85 80	Merit x Filot	7900	12355	000 000 000 000 000	ر ا ا	20	Logic Clare	15,0	13.4	ا ا ا	2 8	0,0	! r	829	က မ	င္သ ဒ
\$\text{1.00}\$ \text{1.00}\$ \tex	Dilot w Mida	ישרו	0069	36.3	0.29	82.6	15:0	14°2	74.5	20.	3 6) r	-i -	045 045	S #) (2)
37.1 62.3 32 15.0 14.5 73.5 .49 67 1.9 .92 885 80 6.8 3.0 10 2.1 2.4 3.6 .11 9 1.5 1 185 20	Mida Mida	7/20	12008	20.00	6,00	200	14.0	14.1	77 0	1 <	60	ر ا ا	-t	2 50	<u>0</u>	ر ا ا
3e 37.1 62.3 32 15.0 14.5 73.5 .49 67 1.9 .92 885 80 6.8 3.0 10 2.1 2.4 3.6 .11 9 1.5 1 185 20	Cadet		12053	36.1	61.7	8 8	14.4	13.9	7.17	49	88	ָרון מוני	10	804	35	8 8
6.8 3.0 10 2.1 2.4 3.6 .11 9 1.5 1 185 20	Average			37.1	62,3	32	15.0	14.5	73.5	49	19	1.9	.92	885	80	86
	Range			6.8	3,0	10	2.1	2.4	3.6	7.	0	1.5	ref	185	20	or

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Table 3 .-- Continued.

Gross 1764 x Henry	N. No.	· 2			9	-					A 177 P. S.				
1764 x Henry			Yield	<u></u>		Wheat Flour	Flour	Yield.	Ash	tion	tion Time	Bromate	: Loaf	:Color:	Grain
1764 x Henry			Bu.	Lbs.	Pct.	Pct.	Pct.	Pct. P	Pct.	Pct.	Min.	Mg.	သည	Score	Score
The many or Code	2232	12637	33.9	57.7	56	15.5	14.7	71.8	.41	65	2.0	en .	928	80	85
neury x cauer	2239	12779	35.7	58.1	32	15,3	14.8	72.4	.42	99	0,0	~	922	00 1	80
Cadet	0 500	12053	40°3	တ္ရ ကို ကို	90	12.0	14.5	73.7	٠ 4	67	0.0	۰۱،	880	82	S f
1764 x 1753	2273	12733	T. 05	200	15	ביים היים היים	4 4	7.1/	14.	0 4 7.	0,0	-10	693) (2) (3)	200
1/64 x henry	1777	12488	0 00	2000	1 C	10.01	15.1	72.50	1 4	5.4	0,0	۷ ۲	W 10	ה מ ס	2 6
1000 1 1/2 do	1024	12483		61.19	3 6	15.0	19.4	74.0	5.4	ל נכ ס ע	, ר ה	40	1 6	g 6	א מ ה
Pilot	1761	11945		58.3	200	15.1	14.0	71.8	.42	63	2.0	10	864	200	32.0
Pilot x Thatcher	2030	12736	34.8	59.4	58	15,2	14.1	72.4	.43	.65	1.5	0	862	75	82
Marquis		3641		0.09	32	14.8	14,3	72.7	.46	65	2.0	0	845	80	82
1552 x Mida	2083	12543	45.5	60.3	34	14.3	13.7	72.6	.41	64	1.5	ÇH	845	90	82
1691 × 1756	2105	12541	33.66	0.09	33	15,3	14.5	72.4	.39	99	1,5	Ö	845	75	80
Rushmore	0,00	12273	32,0	29 29 20 21	32	14.7	143	75.0	•43	65	0,1	0	836	82	က္ဆ
Henry x 1907	25-22	17/71	33°0	0 0 0 0	35	ည်း (၂)	1,0,1	0.17	4.	62	Ω. I	> (824	တ္က မ	5,5
T/30 X T/33	50802	TCCZT	0.40	200	200	10,00	14°/	7.1.3	. f	ဂ ရ	ر ار	۰ د	AIR G	င္က ဇ	င္က မ
Inatoner	4 3 P	12000		01°3	5 5	14.0	בי ק ק	2.47	4° 5	D 4	n 0	-1 C	218	2 u	Ω; c
Dila + Mosit	1000	12648	37.0	T* 09	37	1.01	12.4	0.07	240	, L	000		200	0 W	3 6
Cares A Merica	000	2009		200	3,6	14.0	140	74.7	1.4	על	000	۱ ر	100	C a	2 G
1750 x 1753	2002	12549	• 1	59.4	1 00	15.3	14.3	72.4	. 4	6 4	ין ר- ס וני	0 0	786	8 0 10 10	5 K
Pilot2 x Merit	2174	12732	40.9	59.1	27	13.9	13.0	74.3	47	99	2.0	2	767	82	85
Pilot x Merit	1858	12442	31,3	60.1	27	14.7	13.8	72.9	.49	67	2.5	2	764	75	80
1590 x Thatcher	1956	12630		2.09	33	14.0	13,3	75.1	4.	65	ς• π.	٥.	715	80	75
Average			36.5	59.8	31	14.9	14.2	73.1	43	65		96	836	82	83
Range			14.5	4.4	14	2.1	2.1	4.1	10	4	1.0	m	213	12	15
								1							
					Akron,	- 1	Colorado	* *							
Reward		8182	-	60.4	56	16.2	15,5	72.1	09*	9	2,5	-1	1067	75	80
Cadet	.	12053	EQ.	55.9	23	15,3	14.7	71.7	.56	62	3,0	- 1	895	80	82
Filot x Eerit	2174	12732	~ ⟨	59.5	22	4.5	13.9	74.6	19,	49	ص د ص	0.9	916	88	မှ မ
Thatcher		10003	0 0	2 10	2,5	14.4	17.0	74.1	יי טרני סרני	9 9	ກິດ	> <	100 g	3, 6	3 8
Lee		12488	ເດ	59.2	29	14.5	14.0	74.8	520	63	ຸດ	2	865	88	8,8
Mida	. !	12008	9	60.1	25	13.9	12.9	74.0	.53	09	3.0	-	807	85	80
Filot x Mida 1750 x 1753	1953 2092	12445	4 w	0°09	2 2 4 7	13.5	12.5	75.2	525	6 2	0 0	00	803 775	80	0 0 0
			.				2			3	,	·		2	3
Average Range	÷ .		5.6 4.5	59.2	7	14.6	13.8	3.5	.56	19	3.1	2 56	888	12	85 10

Table 4.--Yield, milling, baking and chemical results on hard red spring wheats grown in replicated "plots" composited from Minnesota stations.

Minnesota Intrastate 1/

	State or	C. I. Acre	Acre	Test	Pearl-	Protein	ein	Flour		bscrp-	Abscrp-Wixing:		num Bak	Optimum Baking Methods	lods
44	N. No.	. No.	: Yield:Weight:Index	Weight	:Index:Value	Wheat	Wheat Flour Yield		Ash :	tion	Time	Bromate	Loaf	: Loaf :Crumb: Grain :Volume:Color:Texture	Grain
			Bu.	Lbs.	Pct.	Pot.	Pct.	Pct. P	Pct.	Pot.	Min.	Mg.	පි	Score	Score
N	2806	12740	27.4	58.0	56	14.4	14.1	74.2	•56	8	2.0	٦	931	95	06
10	2805	12768	27.4	57.7	27	15.4	14.6	72.9	•58	2	2.5	2	868	82	8
10	2824	12641	30°5	61.5	32	14.0	13.7	74.8	.47	63	2.0	-1	968	82	85
	2804	12771	29.0	58.8	28	13.6	13.0	73.2	•54	68	2.5	H	833	82	8
		12488	30.8	59.5	30	14.1	13.6	73.2	• 20	99	2.5	- T	360	06	06
		12273	29.5	59.5	30	13.2	12.7	75.5	.52	62	2.5	-d	829	80	85
		12053	25.9	56,3	. 53	12.7	12.1	71,4	.53	99	2.5	-1	856	80	95
		11945	26.2	57.2	23.	12.6	11.7	71.9	.50	09	2.0	<u>ر</u>	845	75	80
		12265	33.8	59,3	33	12,3	11,4	75.6	• 50	19	2.0	H	833	.75	80
		10003	22.5	56.5	22	13.0	12.8	72.9	09°	63	2,5	7	815	75	06
		11708	26.5	58.2	56	12.1	11.5	75.5	.51	63	2.5	Н	801	. 08	82
	1953	12445	29.5	60.4	52	12.0	11,5	72.7	.52	63	2,0		792	8	80
		12008	27.6	59.3	22	12,3	11.6	74.7	•53	2	2,5	0	716	82	82
			28.1	58.6	27	13.2	12.6	73.7	.53	2	2,3	1,00	845	82	87
		1	11,3	5.2	11	3.4	3.2	4.2	•13	ω	ហឹ	2	215	50	15
15 C*	Rosemont, Morris, Crookston and Waseca	ton and	Vasec	a stations.	ions.						:				
				Mirr	Minnesota	Composite Plots	te Plo	ts 1/							
1															
	2211	12773 10003 12008	32.0 24.4 28.0	57.0 56.3 59.8	30 28 28 28	122.0	11.54	72.7 71.4 74.5	51.53	63 61 62	0000		892 804 722	75 85 85	80.
			28.1	57.7	28	12.5	11.9	72.9 3.1	53	62	2 2.12,	00 0	806	10	83
1 ×	Morris and Crookston stations.	tions.				-						, ·			
				Minn	esota	Minnesota Composite	te Plots	ts 1/							
		12496	27.1	56.4	58	13.0	12,3	72,5	•50	62	2.5	. ; °н	845	85	85
11															

1/ Morris, Crockston and Rosemont stations.

Table 5.--Yield, milling, baking and chemical results for newer hard red spring wheats grown in single increase plots in 1950. Langdon, North Dakota

Variety or	: State or :C. I.:Aore	 	Aore:	Test	Pearl-	Protein	ein	Flour		bsorp-	Absorp-:Wixing:		Optimum Baking Methods	ring Met	pods
Cross	. M. No.	: No. :Yield:Weight:Index	Yield:	Weight		Wheat Flour Yield	Flour		Ash :	tion	k Time	Bromate	: Loaf	: Loaf :Crumb: Grain: :Volume:Color:Texture	Grain Texture
			Bu.	Lbs.	Pct.	Pct.	Pct.	Pct. 1	Pct.	Pct.	Min.	Mg.	පි	Score	Score
Henry x Cadet	2239	12279	20.1	58.2	30	13.9	13,4	75.0	.48	29	2.5	œ	848	75	82
1898 x Lee	2292	12967	26.9	59.9	28	14.0	13,3	74.3	•48	.89	3.0	~	688	82	8
1764 x Henry	2232	12637	12.2	56.2	52	13,0	12,5	73.8	•52	99	3.0	~	893	2	82
Henry x Cadet	2233	12781	19.0	58.8	31	13.7	13,4	78.0	•52	99	2.0	Ŋ	879	75	82
Thatcher	Check	10003	13.8	58.0	25	12.5	11.8	75.3	64.	2	2.5	٦	845	75	82
1750 x Timstein	2237	12734	18.5	59.1	30	13.2	12,8	74.4	.49	64	2.0	H	833	82	8
2109 x 1912	2299-		14,4	55.6	. 22	12.6	12.2	74.3	.51	2	2.0	2	833	2	82
Lee x 1912-1898	2294		23.6	58.0	53	12.8	15.0	75.2	•48	8	2.5	0	830	75	8
Lee x 1831	2295		19.4	58.2	28	12.9	12.2	75.9	•52	29	5°0.	2	795	82	82
Henry x 1907	2242	12777	14.6	59.6	SS.	12.0	11.6	74.4	.53	65	2.0	2	787	65	8
Larquis	Check	3641	0.0	55.2	12	11.7	11.2	70.5	*27	65	2.5	 1-	775	2	82
2035 x 2109	2298	12790	22.7	60.7	56	12.0	11,3	74.7	•46	2	2.0	m	772	8	8
Henry x Cadet	2300	12966	21,1	56.6	52	12.2	11.5	71.8	¥.	29	2,5	~	167	75	80
Mida	Check	12008	15,3	57.4	22	12.1	11,3	73.4	.49	65	2.5	~ -1	761	80	82
Kwan Do-Pilot x 2041	2303		13.8	55.0	23	12.0	11.5	71.4	• 58	69	2.0	r=4·	740	65	8
2109-1912 x Lee	2293		21.4	60.5	24	12.6	12.1	76.2	•52	29	2.0	~ !	735	09	75
Kwan Do-Pilot x 2041	2305		17,3	58.0	24	11.6	10.9	72.0	.52	65	5.0	0	732	2	8
Kwan Do-Pilot x 2041	2304		10,3	56.2	21	11.4	10.9	71.3	•52	64	2.5	~1	729	65	82
1912 x 1919	2302		.17,3	58.2	56	12.6	12,5	75.9	19.	99	1.5	~	723	9	75
1764 x Timstein	2301		11.2	51.1	20	12.4	11.9	9.07	. 20	73	υ Γ	2	101	20	8
Average Range			17.1	57.5	26	12.6	12.0	73.9	.53	99 6	2,3	1.20	783	72 35	83

UNIFORM REGIONAL NURSERY

Twenty-six wheats from the Uniform Regional Nursery have been tested in duplicate for their milling, baking, and chemical properties. An Eastern composite was composed of grain from eight stations and grain from eight dry-land stations made up the Western composite. Grain from the irrigated stations was not included or tested.

The results of the quality tests for the Eastern and Western composites and the average of both are shown in table 6. The discussion which follows is based on the average of the Eastern and Western composites.

Acres yields ranged from 20.6 bushels for Marquis to 32.2 bushels for Henry x Cadet, N. No. 2239.

The test-weight-per-bushel of the samples averaged 1.4 pounds higher than last year. There were only four samples that averaged lower than 57 pounds per bushel. These were Marquis, Thatcher, Redman, and 1764 x Henry, N. No. 2232. Redman was also one of the lower test-weight-per-bushel samples in the last two years' nursery trials. Henry x 1907 N. No. 2242, Thatcher x Surpresa II-39-7 and II-39-8, and Newthatch x Timstein-Premier II-43-19 were highest, averaging over 60 pounds per bushel. Thatcher x Surpresa II-39-8 also averaged the highest in test weight last year.

The protein content of the grain averaged 0.3 of a percent less than last year's nursery samples. Those varieties averaging between 15.0 and 15.8 percent were 1764 x Henry N. No. 2211, Henry x 1907 N. No. 2242, Henry x Cadet N. No. 2233, and N. No. 2239, Thatcher x Surpresa II-39-8, Timstein x Newthatch II-42-30, Thatcher x Surpresa II-39-7, Timstein x Newthatch II-42-37, Newthatch x Timstein-Premier II-43-19, Am¹⁰ x Newthatch Ns 3684, Am¹⁰ x Newthatch Ns 3679, and 1750 x Timstein N. No. 2237.

The flour yields for this year's nursery samples were very good. A number of strains produced a flour yield of 74 percent or better. Marquis averaged the lowest with a flour yield of 70.0 percent. Those samples yielding 74 percent or better were Thatcher, Henry x Cadet N. No. 2233, Thatcher x Surpresa II-39-8, Timstein x Newthatch II-42-37, Newthatch x Timstein-Premier II-43-19, and Ns 2744 x 2809 Ns 3274 and Ns 3291. Thatcher x Surpresa II-39-8, 2744 x 2809 Ns 3274 and 3291 were among the strains highest in flour yield in last year's tests.

The milling characteristics were satisfactory for most of the varieties and strains. A number of strains, however, showed hard milling characteristics. These were Pilot² x Merit N. No. 2174, Timstein x Newthatch II-42-37, Am¹⁰ x Newthatch Ns 3684, Pilot x Merit N. No. 1996, and 1585 x Cadet N. No. 2118 rated as fair in milling. 1764 x Henry N. No. 2211 and N. No. 2118 were unsatisfactory in milling, being hard in texture and required more than the normal number of reductions to reduce the middlings to flour.

The flour ash content averaged slightly lower than last year. The lowest in ash content was Newthatch x Timstein-Premier II-43-19 (.41 percent) and the highest was Pilot² x Merit N. No. 2174, averaging .55 percent.

The bread-baking quality of this year's varieties and strains was slightly poorer than last year's samples. Most of the loaf volumes, however, were good considering the protein content of the varieties and strains. There were 11 varieties or strains with an optimum loaf volume of over 900 cc. The 3 varieties or strains having the highest optimum loaf volume were Henry x Cadet N. No. 2233, Thatcher x Surpresa II-39-7, and 1750 x Timstein N. No. 2237. Two of the strains or varieties lowest in loaf volume were 1552 x Mida N. No. 1924-44 and Marquis. Those having the best grain texture and crumb color were Redman, Timstein x Newthatch II-42-30, Newthatch x Timstein-Premier II-43-19, Ns 2744 x 2809 Ns 3274 and Ns 3291, Am¹⁰ x Newthatch Ns 3679, and 1750 x Timstein N. No. 2237. The sample with the poorest grain texture and crumb color was 1585 x Cadet N. No. 2118.

The water absorption of the flour varied over a range of 5.0 percent with Pilot² x Merit N. No. 2174, and 1764 x Henry N. No. 2211 the highest. 1750 x Timstein N. No. 2313 and Thatcher x Surpresa II-39-8 were the lowest in water absorption.

The dough mixing times of this year's varieties and strains were similar to last year's samples. That cher and 1764 x Henry N. No. 2232 had the longest mixing time and those shortest were That cher x Surpresa II-39-8 and 1750 x Timstein N. No. 2237.

The responses to oxidizing agents (potassium bromate) for the 26 strains and varieties tested were about the same as last year's samples. Sixteen varieties or strains required the same amount of oxidizing agents, four samples slightly more, and six samples less than Thatcher. All were within the range generally considered satisfactory for hard red spring wheat.

Probably the most oustanding strains tested this year from the Uniform Regional Nursery are 1764 x Henry N. No. 2211, Henry x Cadet N. No. 2233, and N. No. 2239, Thatcher x Surpresa II-39-8, Timstein x Newthatch II-42-30 and II-42-37, Thatcher x Surpresa II-39-7, 1764 x Henry N. No. 2232, and 1750 x Timstein N. No. 2237. Other strains that are promising except for one or two deficiencies are Pilot x Merit N. No. 1996 because of low protein, and 1585 x Cadet N. No. 2118 which is low in protein and questionable in crumb color of bread.

Table 6.—Yield, milling, baking and chemical results on 26 wheats grown in the Uniform Regional Mursery for the Eastern Composite, Western Composites in 1950.

Eastern Composite 1/

Variety or	state or .C. I. :Acre	C. I	Acre	Test :	Pearl-	Protein	ein :	Flour		Absorp-:Mixin		upti	Optimum Baking Methods	ing Met	spoi
Cross	N. No.	: No. :Yield:Weight:Index	:Yield:	Weight:		Wheat	Wheat Flour Yield		Ash	क्ट्र	. Time	Bromate	: Loaf :Volume	Loaf :Crumb: Grain: Volume:Color:Texture	Grain
			Bu.	Lbs.	Pot.	Pot.	Pot.	Pot.	.00	Pct.	Min.	Mg	ပ္ပ	Score	Score
Thatcher x Surpresa	II-39-7	12782	29.5	65.9	30	14.8	14.7	71.2	.42	09	2.0	Н	936	75	06
Henry x Cadet	2233	12781	59.9	59.4	52	30.5	13,9	74.8	48	63	2.5	 1	928	75	82
Timstein x Newthatch	11-42-37	12783	25,3	℃ 69	36	15,4	14.9	74.0	• 50	64	3.0	, -1	922	90	90
Timstein x Newthatch	II-42-30	12739	27.4	58.5	31	14.5	13.8	71.2	47	09	2.0	-1	915	82	06
Henry x Cadet	2239	12779	30.4	59.4	59	14.7	13.8	72.7	64°	62	2.5	٦	910	75	90
Thatcher x Surpresa	II-39-8	12641	30°2	62.5	30	14.3	13.6	74.4	.42	09	1.5	,- +	908	80	8
1750 x Timstein	2237	12734	28.0	60,1	32	14.6	13.7	71.6	•46	62	1.5	- -1	903	06	8
Newt. x TimPremier	11-43-19	12784	31.5	63.8	30	14.6	13,9	74.5	•40	09	2.0	-1	871	85	82
1764 x Henry	2232	12637	28.7	27.6	52	13.6	13,1	70.4	47	2	3,0	М	865	80	8
Thatcher		10003	20°2	58.0	24	13.7	12.9	74.5	.49	64	3,0	-1	862	80	06
1764 x Henry	2211	12733	30,1	0.09	27	13,7	13.1	71.4	•46	2	2.5	Н	862	82	92
Redman	RL 1834.7		24.5	57°0	28	13,7	13.1	72.6	640	63	3.0	 1	853	90	06
Pilot2 x Merit	2174	12732	25,1	58.6	27	13,3	12.5	73.5	•56	25	2.5	-1	847	80	8
Am Newthatch	Ns. 3684	12742	28.6	58.5	27	14.7	14.1	71.7	.47	2	2.0	Н	847	92	06
Am X Newthatch	Ns. 3679	12786	23.4	58.6	28	15.0	14.8	73,3	45	63	2.5	Н	839	82	82
Amlo x Newthatch	Ns. 3681		28°5	59.2	52	13.7	13.0	72.3	.47	63	2,5	٦	839	8	8
Thatcher x Apex	Sask 2176		20.7	59.5	52	13.7	12,8	72.7	•50	62	2.5	-1	821	75	82
2744 x 2809	Ns. 3291	12741	24.7	0.09	27	13.4	12,5	74.6	•46	9	2.5	7	818	82	8
Henry x 1907	2242	12777	25.7	61.2	53	13,9	13,4	73.2	64*	9	2.0	۲	815	92	90
1750 x Timstein	2313	12778	28.4	26°6	31	13,5	12,8	72.2	.43	09	2.0	0	812	06	92
2744 x 2809	Ns. 3274	12643	25.6	60.2	28	13.6	12.8	74.4	44.	62	2.0	Н	812	80	06
Pilot x Merit	1996	12648	23,3	58.8	22	12,8	11,9	72.0	550	09	0°6	٦	812	75	06
1556 x Mida	2223	12785	24.0	58.6	56	13,2	12,2	72.8	.51	9	2,0	rH	801	75	06
1585 x Cadet	2118	12788	21.2	57.8	24	12.6	11.7	71.0	•50	62	2,5	-1	789	65	85
Marquis		3641	15.9	55.0	24	12.7	12.0	9.99	.48	09	3.0	0	755	75	80
1552 x Mida	1924-44	12746	24.2	59,3	24	12.0	11.1	73.9	•52	09	3,0	0	726	75	08
Average			26.0	59.4	27	13.9	13.1	72.6	.47	62	2.4	88	849	81	89
Range			15.6	8.8	11	3.4	3.8	8.2	91 °	4	1.5	-1	210	20	15

1/ Average of 8 eastern stations - Madison, St. Paul, Waseca, Morris, Crookston, Fargo, Langdon and Brookings.

Table 6 .- Continued.

Variety of	: State or	C. I.: Acres	Acres	Test	:Pearl-	Protein	in:	Flour		Absorp-	: Absorp-:Wixing:	Opti	mum Bak	Optimum Eaking Wethods	spor
Cross	N. No.	: No. :Yield:Weight:Index	Yielda	Veight		Wheat Flour	lour	Yield	Ash	tion	Time	Bromate	: Loaf	: Loaf :Crumb: Grain	Grain
			Ba	T.bs.	Pct.	Fot	Pct.	Pot. Po	Pct.	Pot.	Min.	Mg.	පි	Score	Score
1764 x Henry	2232	12637		57,1	56	15.6	15.6	70:7	:55	.99	3.0	H	1039	80	85
1764 x Henry	2211	12733		58.3	. 58	16.2	16.0	72.2	550	68	2.5		1033	75	85
1750 x Timstein	2237	12734	27.8	59.4	33	16.6	16.5	73.6	.51	64	1.5	H	1027	85	85
Thatcher x Surpresa	11-39-7	12782		62,2	32	16,2	16,1	76.2	.45	63	1.5	, 2	1024	80	82
Henry x Cadet	2233	12781		57.8	32	16.0	15,7	73.1	.50	65	2.0	H	1009	75	82
Pilot x Merit	1996	12648		0.09	28	15.0	14,7	74.6	44	65	2,5	-1	1001	06	82
Timstein x Newthatch	11-42-30	12739		29.0	32	15,7	15,3	73.4	48	63	E,	0	992	95	06
Timstein x Newthatch	11-42-37	12783		58.0	53	16.2	16.0	74.5	.52	99	2,5	r-1	963	82	82
Thatcher		10003		57,4	56	15.7	15,4	73.5	.48	65	0,0		862	80	80
Henry x Cadet	2239	12779		58.5	30	15.9	15,5	73,3	.52	2	2,5	2	959	2	06
Thatcher x Surpresa	II-39-8	12641		61,5	33	16,0	15.6	75.2	44.	62	1.5	2	945	73	80
Pilot2 x Merit	2174	12732		58.3	53	15.5	14.8	71.4	53	89	3,0	0	686	82	6
1556 x Mida	2223	12785		57.7	31	15.9		74.1	.52	64	2.0	-1	686	8	8
2744 x 2609	Ns. 3291	12741		59,3	31	15.6	15,3	74.4	.50	99	2.5	2	934	06	90
1585 x Cadet	2118	12788	26°9	59,3	88	14.5	14.0	72.9	.47	63	2.0	_	928	75	8
1750 x Timstein	2313	12778	29.6	59,3	34	15.5	15,1	74.0	44	62	2.0	, ,	920	75	82
Marquis		3641	25,3	58,7	28	15.7	15.1	73.4	•52	49	2.5	г	919	80	82
1552 x Mida	1924-44	12746	30,3	26.6	53	15,1	14.4	72.2	946	65	2.5	~	918	S	8
Amlo x Newthatch	Ns. 3681	12787	33°3	58,8	53	15.4	12.0	73.4	.51	65	2.5	۲-	916	80	82
Redman		12638	56.9	57.0	9	15,0	14.7	74.6	48	65	2.0	1	915	සු	06
Henry x 1907	2242	12777	28,3	0.09	31	16.4	15.7	72.6	.47	49	2.0	-	606	80	82
2744 x 2809	Ms. 3274	12643	25,9	59.3	30	15.7	15,3	75,4	45	65	2.0	~ 4	668	06	06
Newt. z TimPremier	11-43-19	12784	32.0	63,2	31	16.0	15,5	75,3	.41	65	2.0	~ 4	893	85	8
Thatcher x Apex	Sask 2176	12639	27.2	58,9	56	15.4	14.7	72.1	•48	92	3.0	0	892	75	06
Amlo x Newthatch	Ns. 3684	12742	29.5	57.8	53	15.7	15.4	73.1	•56	65	2.0	H	853	8	8
Amlo x Newthatch	Ns. 3679	12786	28.0	2 6°3	31	16.2	16.1	72.7	. 20°	65	2.0	Ч	853	06	06
Average	\$ 		29,3	59,1	90	15.7	15,3	73,5	643	65	2,3	1.04	945	82	87

2/ Average of 8 western stations - Dickinson, Minot, Moccasin, Havre, Akron, Ft. Collins, Laramie and Bozeman.

10

22

186

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1.5

9

5.5 .15

2.5

2.1

20

8.7 6.2

Range

Average of Eastern and Western Composites

100 100 100 100 100 100 100 100 100 100	: State or	C. I. Acre	Acre :	Test :	ing	Protein	ein	Flour		Absorp	:Absorp-:Wixing:	_	mum Bak	Optimum Baking Wethods	spou
Cross	. N. No.	No.	Yield:	43		Wheat Flour Yield	Flour		Ash	tion	: Time	Bromate	* Loaf	: Loaf :Crumb: Grain	Grain Fexture
			Bu.	Lbs.	Pct.	Pct.	Pct.	Pct. I	Pct.	Pet.	Min.	Mg.	ප	Score	Score
Thatcher x Surpresa	11-39-7	12782	30.4	62.6	31	15.5	15,1	73.7	.44	62	1.8	1.5	980	78	88
Henry x Cadet	2233	12781	30.0	58.6	31	15,3	14.8	74.0	640	49	2,3	1.0	696	75	82
1750 x Timstein	2237	12734	27.9	59.8	33	15.6	15.1	72.6	.49	63	1.5	1.0	996	88	88
1764 x Henry	2232	12637	29.6	57.4	27	14.6	14.4	70.6	• 50	65	3.0	1.0	952	80	88
Timstein x Newthatch	II-42-30	12739	30.5	58.8	32	15,1	14.6	73,3	.48	29	1.8	ις.	952	90	8
1764 x Henry	2211	12733	30°3	59.5	28	15.0	14.6	71.8	.48	99	2.5	1.0	948	80	80
Timstein x Newthatch	II-42-37	12783	27.6	58.5	28	3 8	15.5	74.3	.51	65	2.8	1.0	943	83	88
Henry x Cadet	2239	12779	32.2	29.0	30	15,3	14.7	73.0	,51	63	2,5	1.5	935	73	90
Thatcher x Surpresa	II-39-8	12641	30,7	62,0	32	15.2	14.6	74.8	.43	19	1.5	1.5	927	78	82
Thatcher		10003	24.7	57.7	25	14.7	14.2	74.0	.49	65	3.0	1.0	912	80	90
ot x Merit	1996	12648	26.7	59,4	22	13,9	13,3	73,3	.47	63	2.8	1.0	406	83	88
Pilot2 x Merit	21.74	12732	26.7	58.5	22	14.4	13,7	72.5	.55	99	2.8	S.	893	83	90
Redman	RL 1834.7	12638	25.7	57 °0	53	14.4	13,9	73.6	.49	2	2.8	1.0	883	88	96
Newt. x TimPremier	II-43-19	12784	31.8	63.5	31	15,3	14.7	74.9	.41	63	2.0	1.0	382	82	88
ox Newthatch	Ns 3681	12787	30.8	59.0	27	14.6	14.0	72.9	.49	2	2.5	1.0	378	80	88
2744 x 2809	Ns 3291	12741	25.9	59.7	59	14.5	13,9	74.5	.48	63	2.5	1.5	976	88	90
1556 x Mida	2223	12785	25.8	58.2	53	14.6	13.7	73.5	.52	62	2.0	1.0	370	83	90
1750 x Timstein	2313	12778	29,0	59.5	33	14.5	14.0	73.1	4	61	2.0	ທີ	998	83	9
Henry x 1907	2242	12777	27.0	9.09	30	15.2	14.6	72.9	.48	62	2.0	1.0	362	83	88
1585 x Cadet	2118	12788	24.1	58.6	56	13.6	12.9.	72.0	.49	63	2.3	1.0	829	2	83
Thatcher x Apex	Sask 2176	12639	24.0	59.5	56	14.6	13.8	72.4	.49	2	2.8	ស្វ	857	75	88
2744 x 2809	Ns 3274	12643	25.8	59.8	53	14.7	14.1	74.9	649	8	2.0	1.0	928	82	06
Amilo x Newthatch	Ns 3684	12742	29,1	58.2	28	15.2	14.8	72.4	.52	65	2.0	1.0	920	88	82
Amlo x Newthatch	Ns 3679	12786	25.7	59.0	30	15.6	15,5	73.0.	.48	2	2.3	1.0	846	88	88
Marquis		3641	20.6	56.9	56	14.2	13.6	70.0.	.52	62	2.8	ທີ	837	78	83
1552 x Mida	1924-44	12746	27,3	59.5	22	13.6	12.8	73.1	.49	63	2.8	ທູ	822	83	82
Atterns de			27 7	5 03	000	0 4	24.0	12 1	9	63	0	90	907	60	. 00
Range			11.6	9.9	11	2.2	2.7	4.0.	.12	ດປິຊ	1.5	0.1	158	88	8 ~

INTRASTATE NURSERY COMPOSITES

Results from composite samples of the North Dakota Intrastate Nursery grown at Fargo, Langdon, and Dickinson, and for the Montana Intrastate Nursery grown at Moccasin are given in table 7.

Results for composites for a nursery grown at Fargo, Langdon, Mandan, and Dickinson are given in table 8 along with data on nursery samples from Dickinson, North Dakota, and Brookings, South Dakota.

Table 7.--Yield, milling, baking, and chemical results on hard red spring wheats grown in Intrastate Nurseries composited from stations indicated, 1950 crop.

North Dakota Intrastate Nursery 1/

3764 28.0 61.0 30 14.3 14.0 2292 1296 33.9 60.0 27 14.1 13.9 23.0 12966 33.9 60.0 27 14.4 13.9 24.5 23.0 12966 33.9 60.0 27 14.4 13.9 23.0 12966 33.9 60.0 27 14.4 13.9 23.0 23.45 27.4 58.8 25 13.9 13.2 23.6 23.6 60.7 27 14.5 13.9 23.8 25.1 2907 31.9 26.0 27 14.5 13.9 13.2 23.8 26.6 60.5 26 13.8 13.0 37.9 30.6 61.7 27 14.1 13.3 23.8 25.2 58.5 29 14.7 14.1 23.9 23.0 25.2 58.5 28 14.3 13.4 14.1 25.2 25.2 58.5 26 14.4 14.1 25.2 25.2 28.0 24 14.4 14.1 25.2 25.2 28.0 24 14.4 14.1 25.2 25.2 26 13.8 12.5 13.9 13.3 36.9 29.9 58.6 25 13.9 13.3 36.9 22.9 22.9 22.9 22.0 27 12.5 22.9 22.9 22.0 27 12.5 22.0 22.0 22.0 22.0 22.0 22.0 22.0 2	Wheat Flour Yield Ash Pot. Pct. Pot. Pct.	A 41 Ann		4	ì.	
Bu. Ibbs. Pct. Pct. Pct. Pct. 10003 25.8 59.7 26 14.7 13 14.3 14 12966 33.9 60.0 27 14.4 13 14.2 159.6 53.9 60.0 27 14.4 13 30.2 59.2 27 14.1 13 30.2 59.2 27 14.5 13 14.2 159.7 31.9 60.7 27 14.5 13 26.5 58.0 24 14.7 14.1 13 26.6 60.5 26 13.8 13 25.3 58.6 60.5 26 13.8 13 30.0 58.1 26 14.4 14.2 14.3 13 30.0 58.1 26 14.4 14.2 14.3 13 30.4 59.2 26 13.6 13.6 13.8 13.8 13.8 13.8 58.0 24 14.9 14.3 13 22.9 58.6 25 13.9 14.3 12 22.9 60.6 25 13.9 13.8 13.8 22.9 58.6 25 13.9 13.8 13.8 22.9 58.6 25 13.9 13.9 13.3 12.8 27.7 59.1 28 15.1 14.3 13.8 27.7 59.1 28 15.1 14.3 13.3 12.8 27.7 59.1 30 13.3 12.3 12.3 12.3 12.3 12.3 12.3 12.3	Pot.		emrī.	Bromate L	Volume :Color:	:Color:Texture
28.0 61.0 30 14.3 14 12966 33.9 60.0 27 14.7 13 26.7 58.4 27 14.7 13 30.2 59.2 27 14.1 13 30.2 59.2 27 14.1 13 30.2 59.2 27 14.5 13 31.1 59.7 27 14.5 13 27.4 58.8 25 13.9 13 26.5 58.0 24 14.7 14 30.6 61.7 27 14.5 13 26.6 60.5 26 13.9 13.9 13 26.6 60.5 26 13.9 14.7 14 30.1 59.0 29 14.4 14 28.0 58.1 26 14.4 14 28.2 58.5 28 14.3 13 28.4 59.5 26 14.9 14 30.4 59.5 26 14.9 14 30.8 30.8 59.6 29 14.4 14 28.0 59.6 25 13.9 13.4 12 27.4 58.1 28 15.1 14 28.0 59.6 25 13.9 13 27.4 58.1 28 15.1 14 28.2 59.9 58.6 25 14.7 13 27.4 58.1 28 15.4 15 27.4 58.1 28 15.4 15 27.4 58.1 28 15.4 15 27.4 58.1 28 15.4 15 27.4 58.1 28 15.4 15 27.4 58.1 28 15.4 15 27.4 58.1 28 15.4 15 27.4 58.1 28 15.4 15 27.4 58.1 28 15.4 15 27.4 58.1 28 15.4 15		. Pot.	Min.	Mg.	Cc Score	Score
12966 33.9 60.0 27 14.4 13 26.7 58.4 27 14.4 13 30.2 59.2 27 14.4 13 30.2 59.2 27 14.1 13 30.2 59.2 27 14.5 14.5 14.5 14.5 14.5 14.5 14.5 14.5	0		2.0	6 0		85
12966 33.9 60.0 27 14.4 26.7 58.4 27 14.1 30.2 59.2 27 14.1 31.1 59.7 27 14.5 27.4 58.8 25 13.9 27.4 58.8 25 13.9 26.5 58.0 24 14.7 30.6 61.7 27 14.1 26.6 60.5 26 13.8 30.0 58.1 26 14.4 25.2 58.5 28 14.3 30.0 58.1 26 14.4 24.5 57.8 30 15.1 30.4 59.5 26 14.9 24.5 57.8 30 15.1 30.4 59.5 26 14.9 28.0 58.6 29 14.9 28.0 58.6 29 14.7 27.7 60.4 26 14.2 27.4 58.1 28 15.1 26.3 27.1 59.1 30 13.3	.9 74.2		2.0	1 0	925 75	82
26.7 58.4 27 14.7 30.2 59.2 27 14.1 31.1 59.7 27 14.5 27.4 58.8 25 13.9 27.4 58.8 25 13.9 26.5 58.0 24 14.7 30.6 61.7 27 14.1 26.6 60.5 26 13.8 32.3 58.6 29 14.7 30.1 59.0 29 14.4 24.5 57.8 30 15.1 30.4 59.5 26 14.9 31.4 59.2 26 14.9 31.4 59.2 26 14.9 28.0 58.1 26 14.9 28.0 58.6 27 13.4 29.9 60.6 25 13.9 27.7 60.4 26 14.7 27.7 60.4 26 14.2	75.1		2.5	2		80
30.2 59.2 27 14.1 31.1 59.7 27 14.5 27.4 58.8 25 13.9 26.5 58.0 24 14.7 30.6 61.7 27 14.1 26.6 60.5 26 13.8 32.3 58.6 29 14.7 30.1 59.0 29 14.4 25.2 58.5 28 14.3 30.0 58.1 26 14.4 25.2 58.5 28 14.3 30.4 59.5 26 14.9 31.4 59.5 26 14.9 22.9 58.6 27 13.4 22.9 58.6 27 13.4 22.9 58.6 25 14.9 22.9 58.6 25 14.9 22.9 58.6 25 14.9 22.9 58.6 25 14.7 27.7 60.4 26 14.7 27.7 59.1 30 13.3	74.2		2.0	1 9		85
31.1 59.7 27 14.5 27.4 58.8 25 13.9 26.5 58.0 24 14.7 30.6 61.7 27 14.1 26.6 60.5 26 13.8 32.3 58.6 29 14.7 30.1 59.0 29 14.4 25.2 58.5 28 14.3 30.0 58.1 26 14.4 25.2 58.5 28 14.3 30.4 59.5 26 14.9 31.4 59.5 26 14.9 32.8 58.0 24 14.9 22.9 60.6 25 13.4 22.9 60.6 25 13.4 22.9 58.6 25 14.7 27.7 60.4 26 14.7 27.7 60.4 26 14.7 27.7 59.1 30 13.3	75.0		2.0	2	916 80	85
27.4 58.8 25 13.9 12907 31.9 60.7 27 14.5 26.5 58.0 24 14.7 30.6 61.7 27 14.1 26.6 60.5 26 13.8 32.3 58.6 29 14.7 30.1 59.0 29 14.4 25.2 58.5 28 14.3 30.0 58.1 26 14.4 24.5 57.8 30 15.1 30.4 59.5 26 14.9 31.4 59.5 26 14.9 28.0 58.6 27 13.4 29.9 60.6 25 13.4 27.7 60.4 26 14.7 27.7 60.4 28 15.1 27.4 58.1 28 15.1 27.4 58.1 28 15.4 27.4 58.1 28 15.4	75.9	69 69	2.0	2		06
12907 31.9 60.7 27 14.5 26.5 58.0 24 14.7 30.6 61.7 27 14.1 26.6 60.5 26 13.8 32.3 58.6 29 14.7 30.1 59.0 29 14.4 25.2 58.5 28 14.3 30.0 58.1 26 14.4 24.5 57.8 30 15.1 30.4 59.5 26 14.9 31.4 59.5 26 14.9 28.0 59.6 27 13.4 29.9 58.6 25 14.7 27.7 60.4 26 14.7 27.7 60.4 26 14.7 27.7 60.4 26 14.7 27.7 59.1 30 13.3	75.2		2.0	6		85
26.5 58.0 24 14.7 30.6 61.7 27 14.1 26.6 60.5 26 13.8 32.3 58.6 29 14.7 30.1 59.0 29 14.4 25.2 58.5 28 14.3 30.0 58.1 26 14.4 24.5 57.8 30 15.1 30.4 59.5 26 14.9 31.4 59.2 26 13.6 32.8 58.0 24 14.9 28.0 59.6 27 13.4 29.9 58.6 25 13.9 27.7 60.4 26 14.2 27.4 58.1 28 15.1 27.4 58.1 28 15.4 27.4 58.1 28 15.4	75.7		2.0	2		06
30.6 61.7 27 14.1 26.6 60.5 26 13.8 32.3 58.6 29 14.7 30.1 59.0 29 14.4 25.2 58.5 28 14.3 30.0 58.1 26 14.4 24.5 57.8 30 15.1 30.4 59.5 26 14.9 31.4 59.2 26 13.6 32.8 58.0 24 14.9 28.0 59.6 27 13.4 29.9 58.6 25 13.9 27.7 60.4 26 14.7 27.7 60.4 26 14.7 27.7 59.1 30 13.3	74.3		2.0	0	885 90	90
26.6 60.5 26 13.8 32.3 58.6 29 14.7 30.1 59.0 29 14.4 25.2 58.5 28 14.3 30.0 58.1 26 14.4 24.5 57.8 30 15.1 30.4 59.5 26 14.9 31.4 59.2 26 13.6 32.8 58.0 24 14.9 28.0 59.6 27 13.4 29.9 58.6 25 13.9 27.7 60.4 26 14.2 27.4 58.1 28 15.4 27.4 58.1 28 15.4			2.0	0	82 85	06
32.3 58.6 29 14.7 30.1 59.0 29 14.4 25.2 58.5 28 14.3 30.0 58.1 26 14.4 24.5 57.8 30 15.1 30.4 59.5 26 14.9 31.4 59.2 26 13.6 32.8 58.0 24 14.9 28.0 59.6 27 13.4 29.9 58.6 25 14.7 27.7 60.4 26. 14.2 27.4 58.1 28 15.4	75.7		2.0	2 8	92 90	06
30.1 59.0 29 14.4 25.2 58.5 28 14.3 30.0 58.1 26 14.4 24.5 57.8 30 15.1 30.4 59.5 26 14.9 31.4 59.2 26 13.6 32.8 58.0 24 14.9 28.0 59.6 27 13.4 29.9 58.6 25 14.7 27.7 60.4 26 14.2 27.4 58.1 28 15.4 27.4 58.1 28 15.4			2.0	1 8	31 80	06
25.2 58.5 28 14.3 30.0 58.1 26 14.4 24.5 57.8 30 15.1 30.4 59.5 26 14.9 31.4 59.2 26 13.6 32.8 58.0 24 14.9 29.9 58.6 27 13.4 27.7 60.4 26 14.7 27.7 60.4 26 14.2 27.4 58.1 28 15.4 27.4 58.1 28 15.4	75.3		2.0	1 8		06
30.0 58.1 26 14.4 24.5 57.8 30 15.1 30.4 59.5 26 14.9 31.4 59.2 26 13.6 32.8 58.0 24 14.9 29.9 60.6 25 13.9 27.7 60.4 26 14.2 27.4 58.1 28 15.4 27.4 58.1 28 15.4	13,4 75,4 ,42		2.0	2 8	879 100	06
24.5 57.8 30 15.1 30.4 59.5 26 14.9 31.4 59.2 26 13.6 32.8 58.0 24 14.9 28.0 59.6 27 13.4 29.9 60.6 25 13.9 27.7 60.4 26 14.7 27.4 58.1 28 15.4 27.4 58.1 30 13.3	75.2		2.0	0		06
30.4 59.5 26 14.9 31.4 59.2 26 13.6 12967 30.7 61.6 28 15.1 32.8 58.0 24 14.9 28.0 59.6 27 13.4 29.9 60.6 25 13.9 27.7 60.4 26 14.7 27.7 60.4 26 14.7 27.4 58.1 28 15.4 12630 27.1 59.1 30 13.3	74.9		2.0	2 8	,	06
31.4 59.2 26 13.6 12967 30.7 61.6 28 15.1 32.8 58.0 24 14.9 28.0 59.6 27 13.4 29.9 60.6 25 13.9 29.9 58.6 25 14.7 27.7 60.4 26 14.7 27.7 60.4 26 14.2 27.4 58.1 28 15.4 12630 27.1 59.1 30 13.3	73.6		2.0	7		92
12967 30.7 61.6 28 15.1 32.8 58.0 24 14.9 28.0 59.6 27 13.4 29.9 60.6 25 13.9 29.9 58.6 25 14.7 27.7 60.4 26 14.2 27.4 58.1 28 15.4 12630 27.1 59.1 30 13.3	75.1		2,0	7		82
32.8 58.0 24 14.9 28.0 59.6 27 13.4 29.9 60.6 25 13.9 29.9 58.6 25 14.7 27.7 60.4 26 14.2 27.4 58.1 28 15.4 12630 27.1 59.1 30 13.3	75.1		2.0	L)		08
28.0 59.6 27 13.4 29.9 60.6 25 13.9 29.9 58.6 25 14.7 27.7 60.4 26 14.2 27.4 58.1 28 15.4 12630 27.1 59.1 30 13.3	74.8		2.0	ě		92
29.9 60.6 25 13.9 29.9 58.6 25 14.7 27.7 60.4 26 14.2 27.4 58.1 28 15.4 12630 27.1 59.1 30 13.3	73.8		1.5	2 8		06
29.9 58.6 25 14.7 27.7 60.4 26 14.2 27.4 58.1 28 15.4 12630 27.1 59.1 30 13.3	75.4		2.0	1		85
27.7 60.4 26 14.2 27.4 58.1 28 15.4 12630 27.1 59.1 30 13.3	74.8		2,0	8		92
27.4 58.1 28 15.4 12630 27.1 59.1 30 13.3	75.7		2.0		833 90	92
12630 27.1 59.1 30 13.3	74.6		2.0	2 89		85
	76.5		2.0	1 8		8
14.4	13,8 75,0 ,46	9 65	2.0	1,19 8	872 84	88
3.9 6 2.1	2,9		1.0			15

1/ Fargo, Langdon, and Dickinson.

Montana Intrastate Nursery 1/

Table 7.--Continued.

Variety or	: State or		Acre :	Test:	Pearl- ing	Protein	ein :	Flour		bsorp-	: Absorp-: Mixing:	Opti	Optimum Baking Methods	ing Met	pods
Cross	. N. No.	: No. :Yield:Weight:Index	Yield:V	Weight:		Wheat Flour Yield	Flour		Ash :	tion	Time :	Bromate	Bromate:Volume:Color:Texture	:Crumb:	Grain
			Br.	Lbs.	Pct.	Pet.	Pot.	Pot.	Pct.	Fet.	Min.]/g.	ပ္ပ	Score	Score
Pilot2 x Regent	2363		30,3	58.5	30	17,1	16.7	73,3	.50	68	3.0	2	1052	20	65
Pilot2 x Regent	2183		32.9	58.0	30	16.5	16.1	72.6	.51	69	3.0	~	1052	80	80
Pilot2 x Thatcher	2170		31.6	58.6	58	17.1	16.7	70.4	.48	29	2.5	Н	1047	75	75
1764 x 1753	2213		32.6	27.0	56	16.7	16.2	71.0	•53	69	3,0	-1	1018	75	2
Pilot x Merit	1993		30,3	58.1	- 22	. 16.2.	15.6	72.7	• 20	69	9°0	0	1015	06	80
Pilot		11945	29.6	57.2	56	16.3	15.9	71,8	•46	99	2,5	0	1001	2	80
Pilot ² x Merit	2164		34.2	57.8	22	16,2	15,3	72,3	• 56	2	3.0	0	998	80	80
Pilot x 1514	1931		29.0	57.8	53	16.0	15.7	71.5	.53	69	3°0	7	986	75	85
Comet x Pilot2	1915		26.4	57.6	30	16.5	15.6	71.7	.53	29	2.0	: : :4	086	80	82
Pilot x Mida	1964		33°6	58,0	53	16.0	15,4	72.6	.47	89	2.0	 1	216	82	82
1520 x 1753	2361		30.0	58.9	30	15,8	15,2	73,2	• 20	65	2,5	-	974	80	82
Thatcher		10003	30,5	57,3	59	16.2	15,9	72,7	•46	89	2,5	0.	965	75	80
Pilot x 1514	2014,80		35,3	58.0	28	16.0	15,4	71.5	, 53	69	3.0	p= -	626	20	80
1248 x Merit	2181		35.5	58,0	24	16.2	15,8	73,5	,59°	69	0 6	-	952	80	06
Ceres		0069	30.5	58.2	52	16.4	15.7	69.5	.52	69	2,5	0	945	80	82
Rushmore		12273	30,4	58,7	31	16.3	15,9	73.6	.51	68	0,6	Н	922	75	8.
1520 x 1753	2362		28.0	58.6	53	16.4	15.7	73.4	.51	65	2.0	-	922	20	75
1520 x 1753	2247		34.2	58.6	28	15,3	14.5	73.1	.45	99	2,5	0	916	20	80
1750 x 1752	2218		29.8	59.5	30	15.7	15.2	73.3	.52	. 89	2,0	éН	906	06	80
Ħ	2256		31,3	59,5	27	15.5	14.9	73.6	.57	99	3,0	-1	668	75	80
1764 x 1750	2364		28.1	59,4	22	16,1	15.7	73.9	29°	69	2,5	 1	853	85	82
1750 x Newthatch	2365		31.2	8.09	22	16.5	15,4	73.8	51	68	2,5	-1	842	06	80
1829 x 1750	2366		31,6	60.4	27	15.5	14.7	73.6	44.	89	0.6	7	789	8	80
1760 x 1750	2367		27.2	60.7	28	16.1	15.4	73.7	42.	69	0.8	Н	692	82	80
			,							The second second second		1			
Average			31,0	58,6	28	16.2	15.6	72.6	.51	68	2.7	.79	948	79	81
Range			0.1	3.8	6	1.8	2.2	4.4	•18	Ŋ	1.0	2	283	50	52

1/ Moccasin

Table 8 .- Tield, milling, baking and chemical results on hard red spring wheats grown in the station nurseries.

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Variety or	: State or :C. I.: Acre	C. I.	cre:	Hest.	ing:	Protein	nie	Flour		-dzosqı	:Absorp-:Wixing:		um Bak	Optimum Baking Methods	ods
Cross	N. No.	: No. :Yield:Weight:Index : : : :Value	Yield:	eight		Wheat Flour Yield	lour	(ield:	Ash :	tion	: Time	Bromate	: Loaf	Loaf :Crumb: Grain: Volume:Color:Texture	Grain
			Bu.	Lbs.	Pote	Pct.	Pct.	Pct.]	Pct.	Pct.	Min.	Mg.	ပိ	Score	Score
Henry x Cadet	2378		33.7	58.9	53	14.2	13.8	73.9	640	67	2.0	2	905	85	06
Henry x Cadet	2374		35,4	59.6	27	12.9	12.6	75.1	•46	69	2.0	Н	883	75	85
1898 x Lee	2381		34.2	60.7	31	14.5	13.8	72.2	.41	69	2.5	Н	859	06	06
Henry x Cadet	2375		15.0	60.1	23	13.2	12.7	75.8	48	99	1.5	è	847	82	90
Henry x Cadet	2376		36.2	58.2	28	13.2	12.5	73.1	•44	29	2,5	rd	845	06	06
Henry x Cadet	2373		38.2	60.2	27	12,9	12.4	75.9	.50	65	2.0	2	839	82	06
Henry x 1907	2377		20.7	59.4	30	.12.5	12,2	73,1	•49	2	2.0	H	839	75	80
2035 x 2109	2298		31.2	61.5	27	12.2	11.7	75.0	•46	8	2.0	-1	824	82	85
1764 x Timstein	2301		25.4	53.4	56	12,8	12,4	73,3	09•	73	3.0	r!	812	09.	80
Lee x 1831	2379		23.8	59.2	28	12.9	12,3	73.1	.45	77	3.0	H	908	75	85
Henry x Cadet	2329		29.8	26.7	36	12.4	12.0	72.00	20	99	2.5	ط	198	20	80
2109 x 1912	2299		25.6	57.5	52	12.2	11.7	74.2	•52	63	1.5	H	795	2	35
Thatcher		10003	20.2	57.4	52	12.1	13.6	73.2	.43	99	2.0	٦	784	75	85
1912 x 1919	2302		26.0	58.7	28	13.5	13;2	75,3	20	99	1.5	Н	778	2	75
	2305		29.6	59.5	24	11.8	11.4	73.0	.42	29	ผู	۱. اخ	775	65	85
Kwan Do-Pilot x 2041	2380		18.8	60.7	28	14.0	13,1	72.5	•49	19	1.5	٦	772	65	20
	2303		30.1	57.4	28	12.7	12,4	74.1	•48	29	2.0	Н	694	75	82
Mida		12008	21.9	60.2	30	11.7	11.2	73.7	47	65	2.5	н	.755	75	82
Average			27.6	58.9	. 58	12.9	12,4	73.8	48	99	2.2	1,11	816	76	8
Range		:	17.4	8.1	13	. 2.8	.2.6	3.9	•19	12	1.5	н	150	30	50
		, di		٠											

1/ Fargo, Langdon, Mandan, and Dickinson.

Dickinson, North Dakota (Station Nursery)

Variety or	State or :C. I.:Acr	Acre :	He st	Pearl-	Protein	ein	Flour		bsorp-	Absorp-:Wixing:	Optin	Optimum Baking Methods	ing Met	spou
Cross	N. No. : No. :Yie	Yield:	ld:Weight:Index	Index	Wheat	Flour	Yield	Ash :	tion	Time	Bromate	: Loaf :Volume	:Color:	Grain
		Bg.	Lbs.	Pct.	Pot.	Pct.	Pct.	Pct.	Pct.	Min.	Me	පි	Score	Score
1552 x Pilot	40,5A1-1-5-1-1		57,1	31	16.0	15,4	71.6	.43	65	1.5	2	1110	80	80
1552 x Pilot	40.5A1-1-5-4		57.7	30	16,1	15.5	71.8	•46	69	1.5	2	1044	80	85
1556 x Pilot	2307		57,4	28	15.9	15,5	71.4	44.	62	2:0	2	980	82	85
Regent-Mida x 1552-Mida 2346	2346		1.09	32	15,7	15,3	74.5	.48	29	2.0	2	974	85	85
1556 x 1563	39.9Bl-15-1		58.9	58	15,3	14.7	72.4	.42	. 29	1,5	. 2	971	80	06
Regent-Mida x 1552-Mida 2345	2345		60.2	53	15.0	14.5	74.8	•46	29	2.0	2	959	80	85
Regent x Mida2	2347		59.0	30	14,4	14.0	75,1	64°	65	2.0	2	926	82	06
Pilot x Newthatch	41.25A1-8-4-5		56,3	54	15.0	14.4	71.1	44.	62	2.0	, - 1	951	80	06
1563 x Regent	42,2541-10-1-5		58,3	56	15.0	14.6	74.4	.41	9	2.0	က	943	82	82
Thatcher	10003		58.2	52	15.8	15,1	72,3	41	2	2.0	2	940	75	95
1556 x Pilot	41,11A2-29-5		0.09	27	15,2	14.5	73.0	, 39	63	2.0	-1	937	95	85
Regent x Mida	1844-15		59,3	58	14.5	13.9	74.6	.45	63	2.0	۲,	928	82	85
Regent x Mida	1844-94		0.09	24	14.6	14.2	74.3	64.	64	2.5	0	925	95	85
Regent x Mida2	43.941-4-2		58.2	52	15,2	14.4	72,3	.45	2	2.0	2	916	06	06
Regent x Mida	39.21Bl-17-2-2		60.4	31	14.6	13,9	74.7	48	64	2.0	2	016	85	85
1740 x Mida	2306		60.4	27	15.0	14.4	73.9	.40	29	1.5	7	006	06	06
Regent x Wida	1843-68		58.4	56	14.3	13.8	71.1	•37	62	2.0	2	853	80	80
Average Range			ညီ အ ၈ ၈	28	15.2	14.6	73.1	44	4 o	60.4	3.0	953	2 8	15

Table 8.--Continued.

Brookings, South Dakota (Station Nursery)

Variety or	: State or :C. I.:Aore	C. H.	1	Test	: Pearl-	Protein	ein	Flour		Absorp-	Absorp-:Wixing:		mum Bak	Optimum Baking Methods	hods
Cross	* N. No. : No. :Yield	No.	Yield:	: Weight: Index:	Index	Wheat Flour Yield	Flour		Ash	tion	: Time	Bromate		: Loaf :Crumb: Grain	Grain
			Bu.	Lbs.	Pct.	Pct.	Pct.	Pot.	Pct.	Pot.	Min.	Mg.	පු	Score	Score
Rushmore ² x Surpresa	4979		25.6	62,1	32	15.5	15.2	77.1	.50	64	2.0	2	870	85	85
2109 x 1912	2299		25.9	0.09	53	13,4	13,1	74.3	64.	62	1,5	2	868	2	92
Lee		12488	26.0	61.9	56	14.5	14.2	73.8	•46	99	2,5	2	859	06	90
2035 x 2109	2298		23.9	63.6	28	13.6	12:07	76.7	44.	65	2.5	<u>-</u> H	839	8	92
Rushmore ² x Clarendon	49-91		23,3	60.5	32	13.7	13.3	75.2	.45	4	2.0	ო	830	82	90
Rushmore ² x Clarendon	49-109		21.0	58.7	28	13,3	12,9	74.6	.51	2	2.0	2	830	2	06
Pilot x Merit	2012		20.4	59.8	27	13,1	12,5	74.3	.49	2	3.0	2	812	75	06
Lee x 1831	2295		20.8	0.09	50	13.6	13.0	76.5	,5J	67	2,5	2	801	80	06
1898 x Merit	2292	12967	24.7	62.2	27	14:5	13.8	75,2	44.	89	3,0	Н	792	85	06
Rushmore x Surpresa	49-10		28.7	64.6	56	14.6	13.5	75,8	040	28	1.5	2	789	95	06
Rushmore x Surpresa	49-12		27.2	64,3	53	14,2	13,4	78,4	44.	9	1.0	ო	789	82	06
Rushmore x Surpresa	49-11		28.5	63.9	28	14.4	13.6	76.1	.42	28	1,5	2	784	06	92
Rushmore'x Surpresa	49-61		23.2	62.7	53	14,3	13,5	74.9	44.	62	1.5	7	781	80	8
2109-1912 x Lee	2293		27.4	62,2	56	13,1	12,3	76.2	54	99	1.5	ന	992	06	85
Kwan Do-Pilot x 2041	2304		15,1	58:7	24	12.6	11.9	75.8	.46	2	3,0	2	749	09	80
,															
				r		,									
Average			23.9	61.7	28	13.9	13,3	75.7	47	8	2,1	2.07	811	82	06
Range			13.6	ى ئ	T.	5.0	m m	4.6	•14	12	2.0	2	121	32	15

CCMERCIAL SAMPLES

As in past years a number of commercially grown wheat samples were obtained through the Grain Branch, Production and Marketing Administration for comparison with the varieties and strains produced in experimental plots. Twenty such samples, representing a number of grades and types, were obtained at Denver, Colorado; Great Falls, Montana; and Minneapolis and Duluth, Minnesota. The samples were composited by grade from 3,553 cars of wheat grading No. 3 or better. This is the twelfth season such samples have been tested. The results are given in table 9.

These samples generally averaged lower in protein content than the experimental plot and nursery samples. Otherwise, the milling, baking, and chemical results do not appear to be greatly different, especially when compared with samples having approximately the same protein content and test-weight-per-bushel.

Table 9.---Willing, baking, and chemical results on twenty composite commercial samples of hard red spring wheat obtained at Denver, Colorado; Great Falls, Montana; Duluth and Minneapolis, Minnesota, representing the 1950 crop.

tana Ryy, D.N.S. 594 62.0 1 D.N.S. 162 59.8 2 D.N.S. 133 62.4 4 D.N.S. 137 62.2 1 Hyy, D.N.S. 156 59.2 1 Hyy, D.N.S. 156 59.2 1 Hyy, D.N.S. 156 59.2 1 Hyy, D.N.S. 198 61.5 1 N.S. 198 59.4 1 D.N.S. 200 59.4 1 D.N.S. 200 59.4 2 D.N.S. 2	Ī	Flour Pct. 13.3 14.2 13.5	Mield. A	Ash : tion	Time	te	: Loaf	:Crumb: Grain	Grain
tana 1 Hvy. D.N.S. 594 1 D.N.S. 162 2 D.N.S. 133 4 D.N.S. 133 4 D.N.S. 133 1 Hvy. D.N.S. 150 1 D.N.S. 156 1 Hvy. D.N.S. 156 1 Hvy. D.N.S. 156 1 Hvy. D.N.S. 156 1 Hvy. D.N.S. 198 1 N.S. 115 a 1 Hvy. D.N.S. 220 2 D.N.S. 220 2 D.N.S. 220 2 D.N.S. 220 2 N.S. 100	<u>H</u>	Pct. 13.3 14.2 13.5	l	The second secon			NOTORIC	Color :	:Volume :Color :Texture
Montana 1 Hyy. D.N.S. 594 1 D.N.S. 67 2 D.N.S. 133 4 D.N.S. 133 4 D.N.S. 133 1 Hyy. N.S. 150 1 D.N.S. 150 2 D.N.S. 198 1 N.S. 198 1 N.S. 198 2 N.S. 198 3 N.S. 156 1 D.N.S. 198 1 N.S. 198 2 N.S. 198 1 N.S. 198 2 N.S. 198 3 N.S. 198			Pct. Pct.	t. Pot.	Min	50	පි	Score	Score
nesota hy, D,N,S, 594 1 D,N,S, 67 2 D,N,S, 67 2 D,N,S, 133 4 D,N,S, 137 1 Hy, D,N,S, 150 1 Hy, D,N,S, 198 1 Hy, D,N,S, 198 1 Hy, D,N,S, 198 1 Hy, D,N,S, 198 1 D,N,S, 198 2 D,N,S									
nesota D.N.S. 162 2 D.N.S. 163 4 D.N.S. 133 4 D.N.S. 137 1 Hry. D.N.S. 150 1 D.N.S. 150 1 Hry. D.N.S. 150 1 Hry. D.N.S. 150 1 Hry. D.N.S. 141 2 N.S. 115 1 D.N.S. 115 1 D.N.S. 115 1 D.N.S. 220 2 D.N.S. 200 2 D.N.S. 200 2 D.N.S. 220 2 D.N.S. 2 D.N.S.					2,5	0	842	<u>ල</u>	82
Desota Hyv. D.N.S. 133 4 D.N.S. 133 4 D.N.S. 137 1 Hyv. D.N.S. 150 1 D.N.S. 190 2 D.N.S. 198 1 N.S. 198 1 N.S. 198 1 N.S. 198 1 N.S. 115 2 D.N.S. 2 D.N.S. 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3			Ĭ		2,5	-1	897	82	06
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nesota Hry. D.N.S. 137 1 1 1 1 1 1 1 1 1			74.5 %		2,0	0	845	82	82
nesota Hry. D.N.S. 150 1 D.N.S. 150 1 D.N.S. 190 2 D.N.S. 198 1 N.S. 198 1 N.S. 198 1 N.S. 198 2 N.S. 115 3 N.S. 115 1 D.N.S. 330 1 D.N.S. 220 2 D.N.S. 220 2 D.N.S. 220 2 D.N.S. 200 2 D.		12,4	_	48 66	2.0	0	827	75	80
nesota 1 Hyy. D.N.S. 150 1 D.N.S. 150 2 D.N.S. 156 1 Hyy. N.S. 156 1 Hyy. N.S. 198 1 N.S. 180 3 N.S. 115 1 D.N.S. 115 1 D.N.S. 100 2 D.N.S. 220 2 D.N.S. 100			-		2.0	0	772	75	82
a 1 Hyy. D.N.S. 150 1 D.N.S. 190 2 D.N.S. 196 1 N.S. 198 1 N.S. 198 2 N.S. 198 3 N.S. 198 3 N.S. 198 1 D.N.S. 325 1 D.N.S. 325 1 N.S. 200 2 D.N.S. 80 1 N.S. 100									
a 1 hy. b. N.S. 190 2 D.N.S. 156 1 hy. N.S. 198 2 N.S. 198 3 N.S. 180 3 N.S. 115 1 D.N.S. 325 1 D.N.S. 325 1 N.S. 200 2 D.N.S. 80 1 N.S. 100			-		2.0	Н	820	75	06
2 D.N.S. 156 1 Hvy. N.S. 198 1 N.S. 198 2 N.S. 141 2 N.S. 180 3 N.S. 115 1 D.N.S. 325 1 D.N.S. 80 1 N.S. 200 2 D.N.S. 80 1 N.S. 100			-		2,5	Н	826	75	6
a 1 Hvy. N.S. 198 1 N.S. 141 2 N.S. 180 3 N.S. 115 a 1 Hvy. D.N.S. 325 1 D.N.S. 330 1 N.S. 80 2 D.N.S. 80 2 N.S. 100			-		2,5	0	854	80	06
a 1 M·S. 141 2 N·S. 180 3 N·S. 185 a 1 M·S. 115 1 D·N·S. 325 1 D·N·S. 330 1 D·N·S. 80 2 D·N·S. 80 2 N·S. 100			-		2.5	Н	99/	75	82
2 N.S. 180 3 N.S. 115 a 1 Hvy. D.N.S. 325 1 D.N.S. 330 2 D.N.S. 80 1 N.S. 220 2 N.S. 100	30 12,2	11.4	75.1 .4	48 65	2,5	H	167	20	80
a N.S. 115 a 1 Hvy. D.N.S. 325 i D.N.S. 330 i D.N.S. 80 c 2 D.N.S. 80 i N.S. 220 c N.S. 100					3,0	0	789	8	8
a 1 Hyy, D,N,S, 325 1 D,N,S, 330 1 D,N,S, 200 2 D,N,S, 80 1 N,S, 220 2 N,S, 100			•		3.0	0	908	. 08	82
1 Hvy. D.N.S. 325 1 D.N.S. 330 1 D.N.S. 200 2 D.N.S. 80 1 N.S. 220 2 N.S. 100									
1 D.N.S. 330 1 D.N.S. 200 2 D.N.S. 80 1 N.S. 220 2 N.S. 100					3.0	0	801	75	82
1 D.N.S. 200 2 D.N.S. 80 1 N.S. 220 2 N.S. 100	28 13.9	13.0	74.3 .	.47 65	3.0	1	877	82	90
2 D.N.S. 80 1 N.S. 220 2 N.S. 100			-		3,0	H	877	75	8
1 N.S. 220 2 N.S. 100			Ī		3,0	- -I	873	8	85
2 N.S. 100			_		3.0	-1	167	75	82
なし シャンプル					3.0	H	992	2	82
TACK COLOURS									
Do. 1 Hvy. D.N.S. 24 62.4	27 11.8	11.2	73.0 .	49 64	2.5	0	741	80	82
Average 60.4	29 13.0	12,4	74.3	48 65	2.6	•50	821	78	87
Range 4.4					0°H	1.00	156	20	10

CORRELATION AND REGRESSIONS

Correlation coefficients (r) for optimum loaf volume and flour protein content of eight varieties and strains have been calculated and are presented in table 10. Also shown in this table is the slope of the regression line or the change in loaf volume for each 1.0 percent of protein (b₁), the average protein content of the flour and the loaf volume of the bread, and the loaf volumes adjusted to a 13.0 percent protein basis by the means of the regression equation. The plotted regression lines for each variety are shown in two graphs in figure 1.

The graphs show that the relation between loaf volume and protein content is generally linear. These results are in accordance with those of the last six years (1944 to 1949) where, with a few exceptions, the points fell on or very close to the calculated regression lines. Most of the correlation coefficients for loaf volume and flour protein content are high. The highest coefficients are for Pilot and Lee. The wheat having the lowest coefficients this season was 1764 x Henry. It should be noted that the number of samples of each variety is rather small for a study of this kind. This fact should be considered in evaluating the results.

One of the important results of this study and of interest is the difference in the level and particularly in the slope of the regression lines for the different varieties. The regression lines for the eight wheats shown in the two graphs include the regression lines for Thatcher and Mida repeated in each graph as standards of comparison. There was some variation in the slope and level of the regression lines among the varieties compared in graph A. A comparison of the regression lines shows that 1764 x Henry is perhaps the best of the wheats in quality compared in this graph. The change in loaf volume for 1 percent of protein was highest for Pilot (54.7 cc.) and lowest for 1764 x Henry (36.2 cc.). The loaf volume converted to a 13.0 percent protein basis shows that Thatcher and Mida were lowest and 1764 x Henry highest of the group.

Cadet in graph B appears to be better in quality than the other varieties. Lee appears to be much like Mida, both lower than Thatcher. The loaf volume converted to a 13.0 percent protein basis shows that Thatcher is highest of the group and Mida lowest, with Cadet, Rushmore, and Lee falling in between.

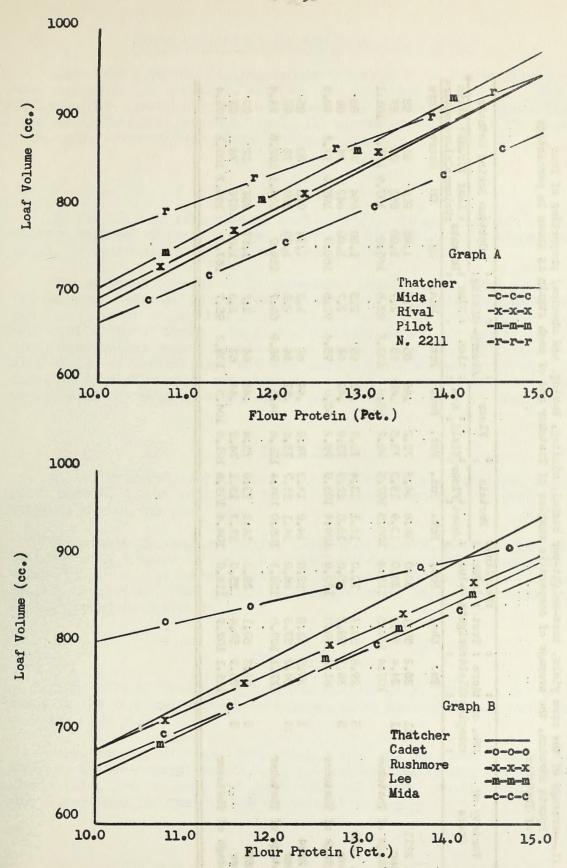
Table 10.--Statistical summary of protein content-loaf volume data for varieties of hard red spring wheat.

Variety or Cross	:State : or :N. No.	No. of samples	b ₁ <u>1</u> /	r <u>2</u> /	: of : flour	; loaf :Volume	:Loaf volume at :13.0 pct. pro- :tein content 3/
		• •			Percent	CC :	
1764 x Henry Pilot Rival Thatcher Cadet Rushmore Lee Mida	2211	11 13 12 25 17 11 17 20	36.2 54.7 51.5 51.8 43.7 42.8 49.3 43.3	.810 .954 .876 .900 .912 .911 .924	14.3 13.8 12.3 13.4 13.4 13.5 14.1 12.6	919 909 809 858 850 839 855 781	872 866 845 837 833 818 800 798

1/ Slope of the regression line or the cubic centimeter change in loaf volume for each 1 percent of protein.

3/ Calculated from regression equation.

^{2/} Correlation coefficients for loaf volume and flour protein content. All correlation coefficients are significant at the 1 percent level.



ig. 1.—Regression lines for flour protein and loaf volume for a number of hard red spring varieties and strains with Thatcher and Mida included for comparisons, 1950 crop.

Table 11.--Average of the acre yield, test-weight-per bushel, milling, baking, and chemical properties of four hybrid strains, the average of comparable samples of Thatcher and of each strain as shown in percentage of Thatcher.

						-	-		-		and the second second second second			
Variety or	No. of	No. of tAcre	: Pest : Index	Pearling Index	40 40	Protein	F10	Flour :	Absorp-:Mixing	: Mixing	40 40	Optimum Baking Methods	ing Met	spot
Cross	:Sample	:Samples:Yield	:Weights	Value	Wheat	Wheat Flour Yield	Yield	Ash	tion	: Time	Bromate	: Loaf :Crumb: Grain: Volume:Color:Textur	:Crumb: Grain	Grain
		Br.	Lbs.	Pot.	Pot.	Pct.	Pct.	Pot.	Pct.	Min.	Mg.	පි	Score	Score
N. No. 2211	45	26.2	59.1	30.0	13.9	14.3	72.2	946	63	2.5	1.45	919	80 81	88
Percentage of Thatcher		107.4	, .	115.4		107,5	98.2	95.8	103.2	95.6	145.0	107.9		101.1
N. No. 2239 Thatcher	ນນ	29.8	58.7	30.0	14.1	13.4	73,3	48	63	2.5	1.00	884	74 76	85
Percentage of Thatcher		81.2	1 1	120.0		103.9	99.5	0.86	98.4	95°6	160.0	105.0		98.8
Minn. 2824 Thatcher	8 8	30.5	61.8	32.0	14.8	14,3	74.8	4.53	23 24	1.7	1,34	916	80	90
Percentage of Thatcher	ier	127.1		133,3			9°101	84.6	6.96	2.09	134.0	104.1	102.6	94.4
N.D. 3654 Thatcher	ന ന	25.9	58.4	29.0	14.3	13.6	75.4	94.	62	2.2	1.67	882	82 78	90
Percentage of Thatcher	ier	115.1		116.0			101.6 104		103.2	95.7	167.0	100.7	105.1	103.4

MOTES ON SOME OF THE NEW PROMISING STRAINS

Each year many new strains are tested along with the leading commercial varieties for chemical, milling, and bread-baking quality. The four following new hybrid strains, expressed as a percentage of comparable samples of Thatcher (shown in table 11) appear to be some of the more promising strains tested during the past year.

N. No. 2211

N. No. 2211 is 1764 x Henry (C.I. 12733). It was included in the Uniform Regional Nursery for the first time in 1949. It is a very early wheat, is bearded, and has moderate resistance to leaf rust.

The weighted average of 11 comparable samples shows that N. No. 2211 has exceeded Thatcher in test-weight-per-bushel, protein content of wheat and flour, water absorption of flour, loaf volume of bread, grain texture and crumb color of bread. It yields slightly less flour and is lower in flour ash content than Thatcher. Most samples of N. No. 2211 have generally milled satisfactorily, but some have shown a tendency for the middlings to be difficult to reduce to flour. It is a wheat of good strength, considering the data as a whole, but not quite as strong as Thatcher.

N. No. 2239

N. No. 2239 is Henry x Cadet (C.I. 12779) and was developed at Langdon, North Dakota. It is resistant to leaf and stem rust and was grown at five stations during the past year.

Comparable milling and baking tests show that N. No. 2239 has exceeded Thatcher with respect to protein content of wheat and flour, and loaf volume of bread. It is very similar to Thatcher for most of the other quality properties. The quality of the gluten is good, but not as strong as that found in Thatcher.

Minn. 2824

Minn. 2824 is Thatcher x Surpresa II-39-8 (C.I. 12641). Two years' tests in the Regional Nursery have shown it to have good leaf rust resistance and high yield.

Three samples of Minn. 2824 grown during the past year show it exceeded Thatcher in test-weight-per-bushel, protein content of wheat and flour, flour yield, loaf volume, and crumb color of bread. It averaged considerably lower than Thatcher in ash content of flour.

N. D. 3654

N. D. 3654 is Lee x 3175. It has been a high yielding wheat of good quality.

The weighted average of three comparable samples shows that N. D. 3654 has exceeded Thatcher in most of the characteristics for which comparisons have been made. It has exceeded Thatcher in protein content of wheat by 0.6 of a percent, crumb color of bread by a score of 4 points, and grain texture by a score of 3 points among the principal quality properties compared.